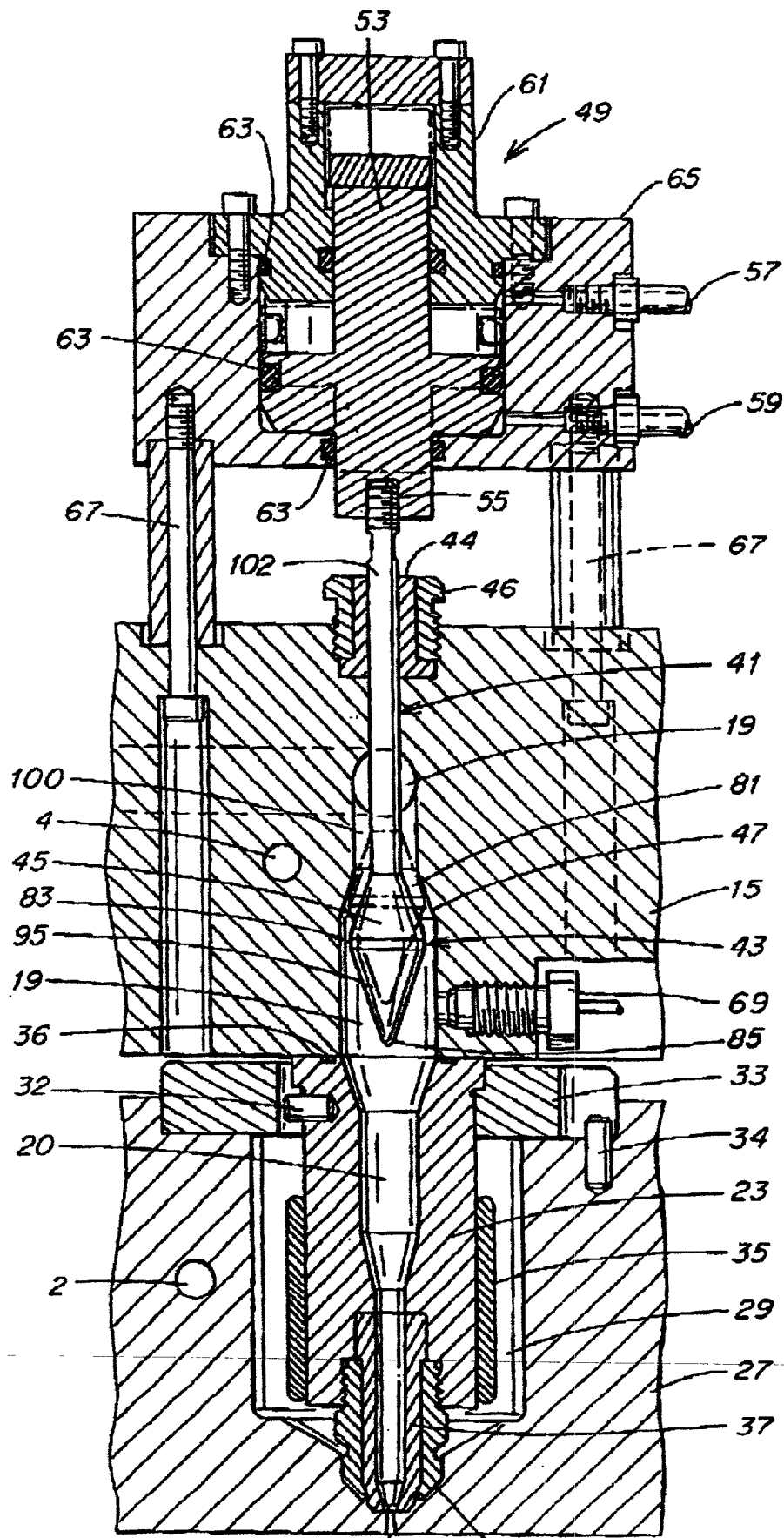


5



9 Fig. 2 39

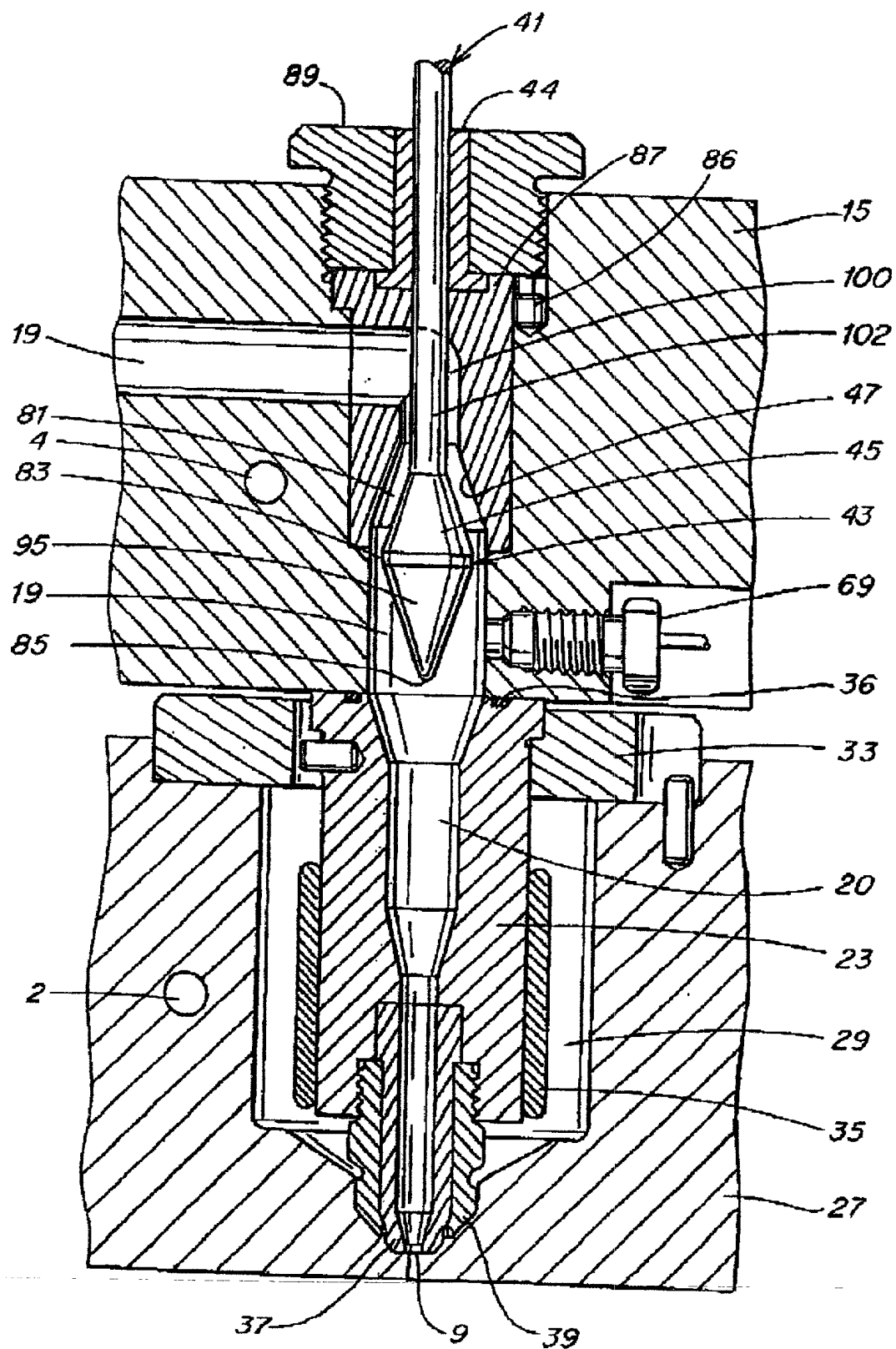


Fig. 3

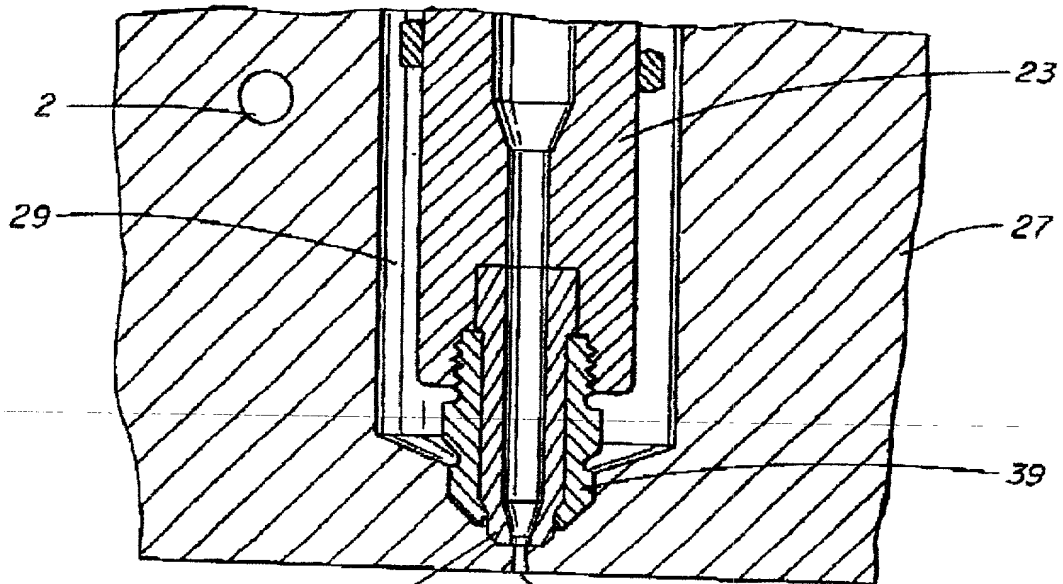
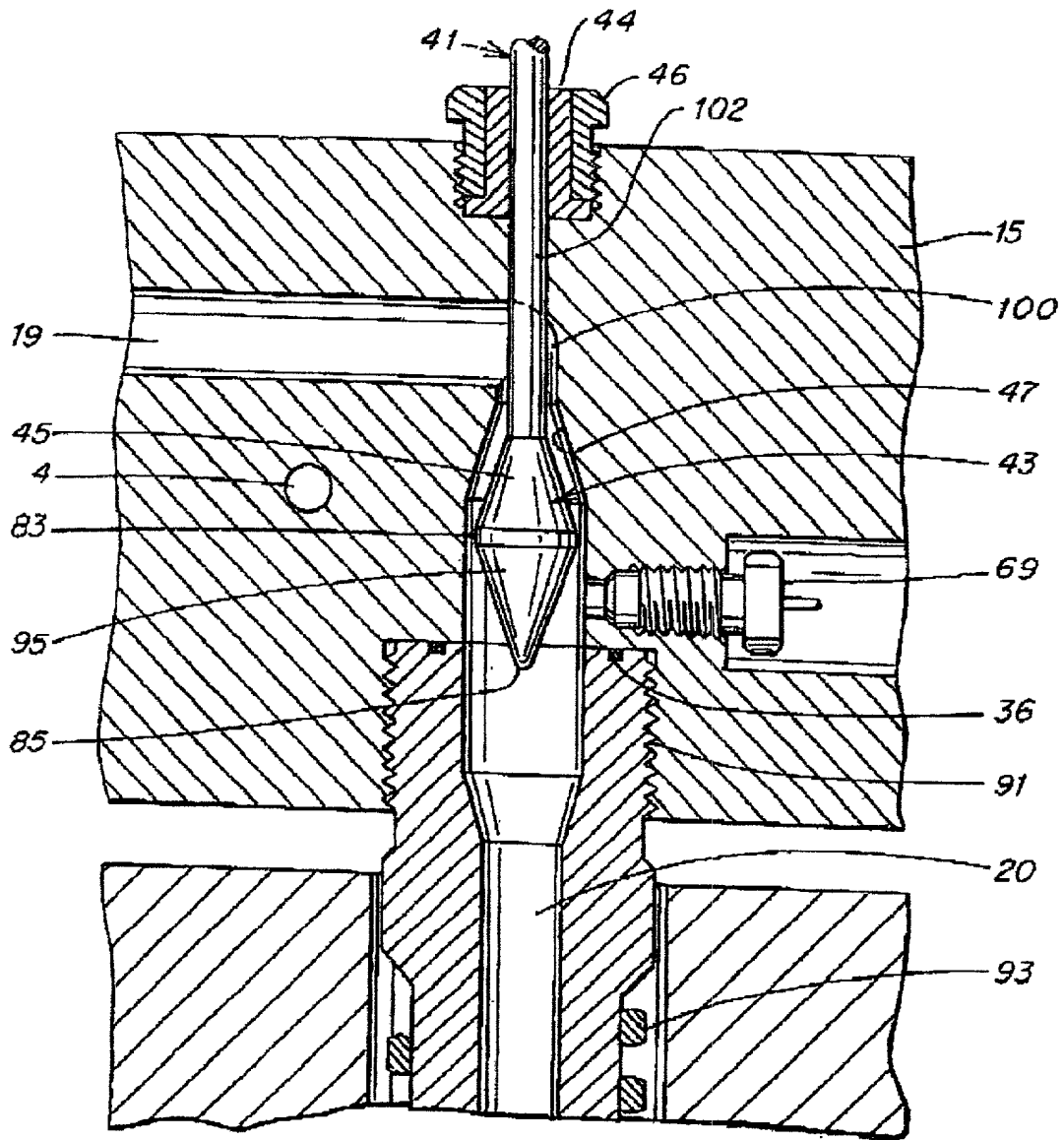
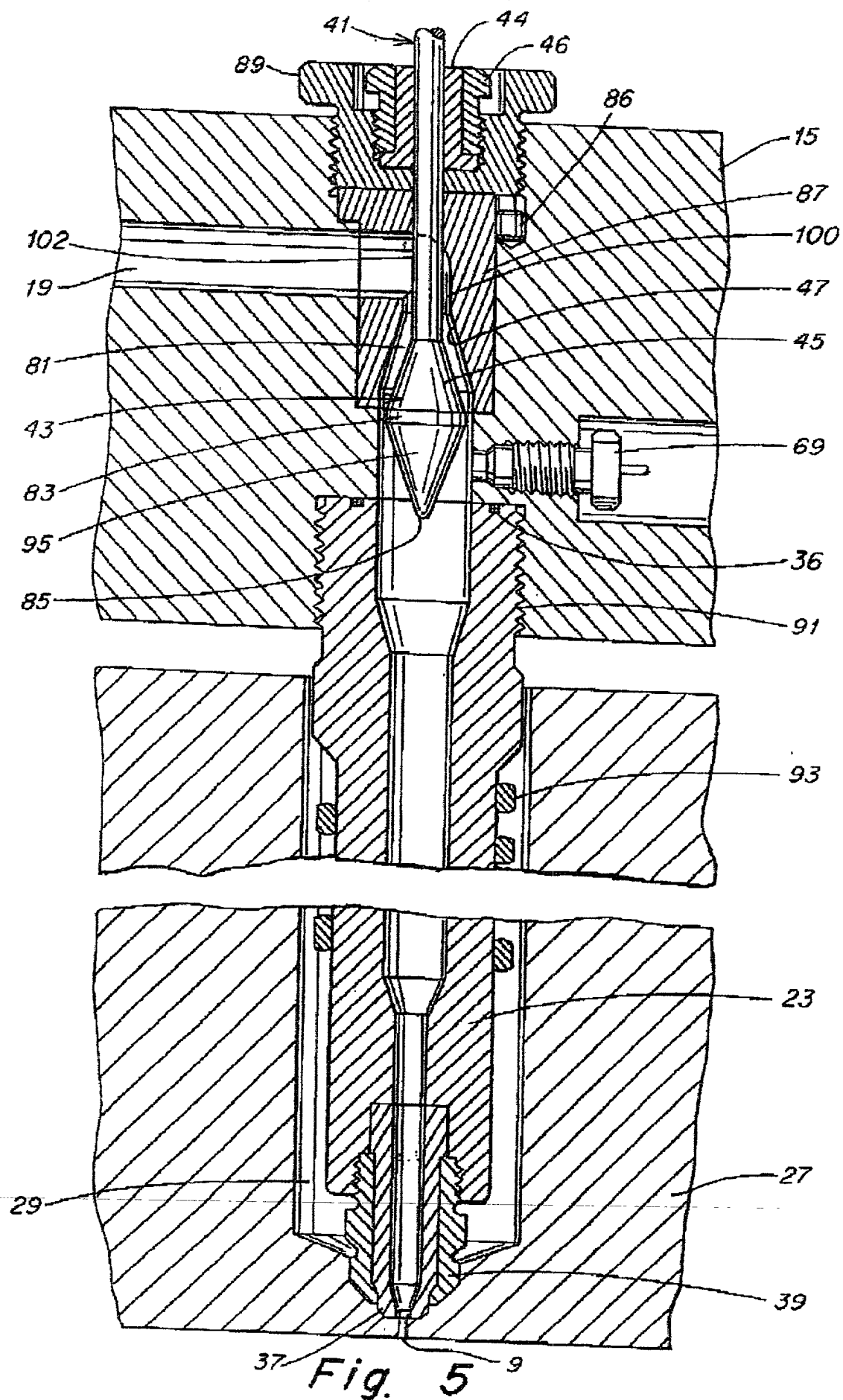


Fig. 4 9



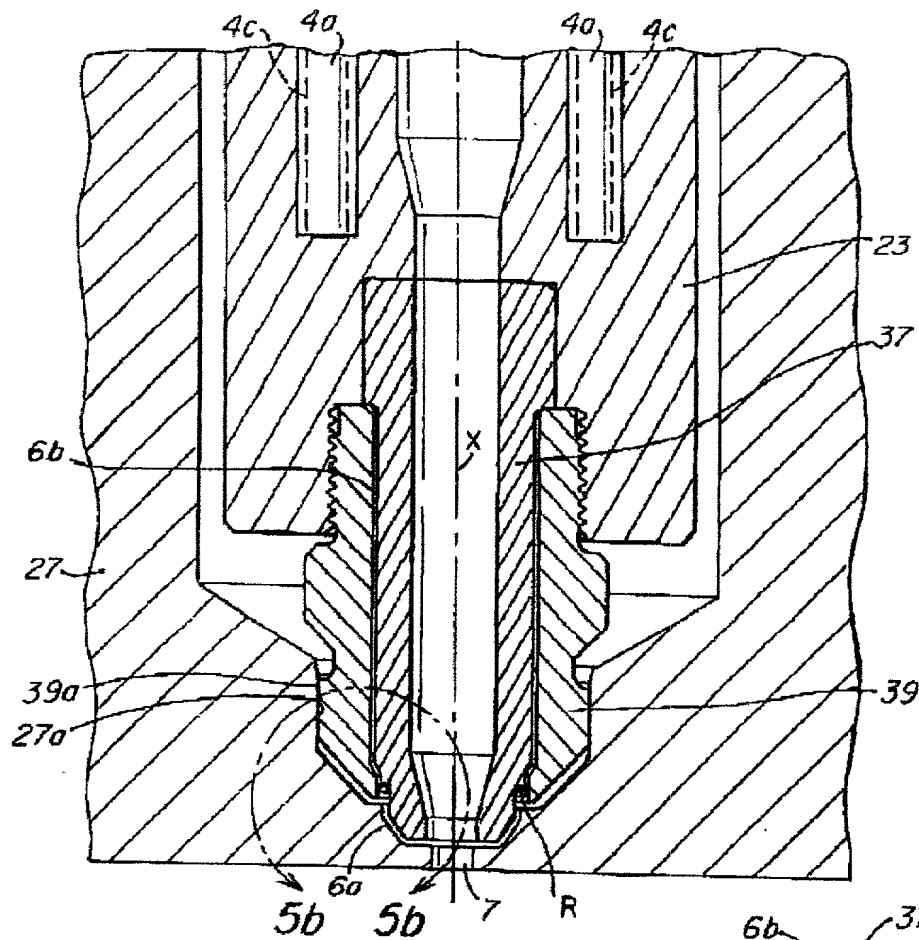


Fig. 5a

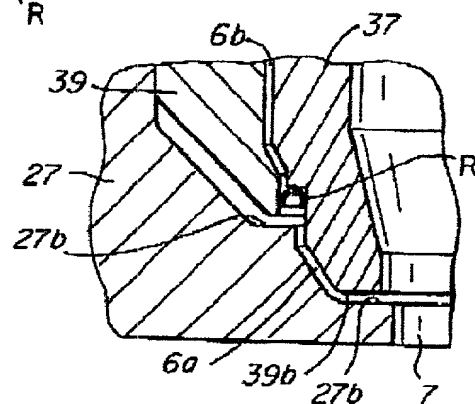


Fig. 5b

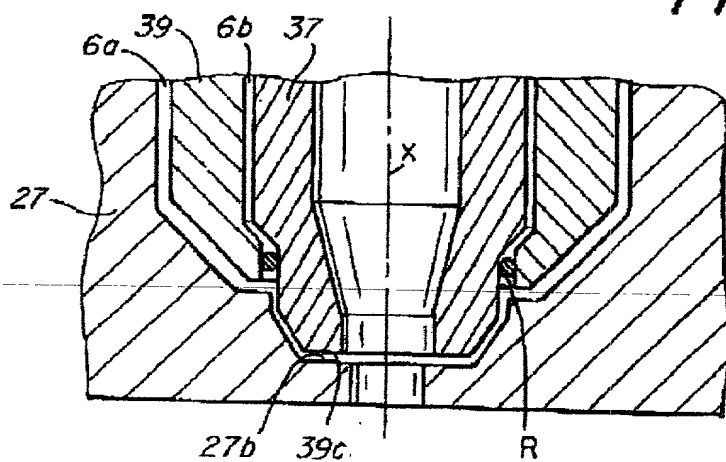


Fig. 5c

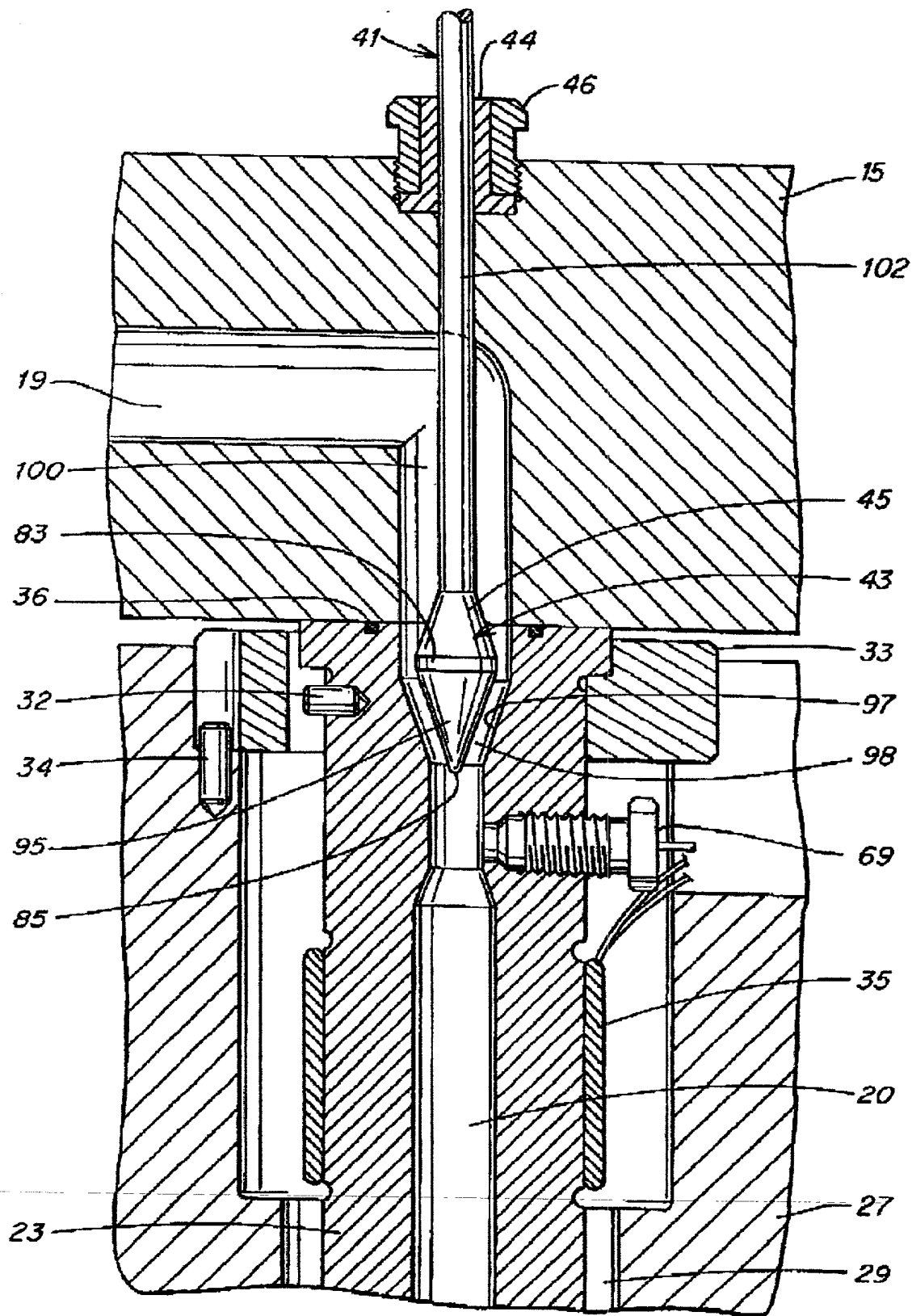


Fig. 6

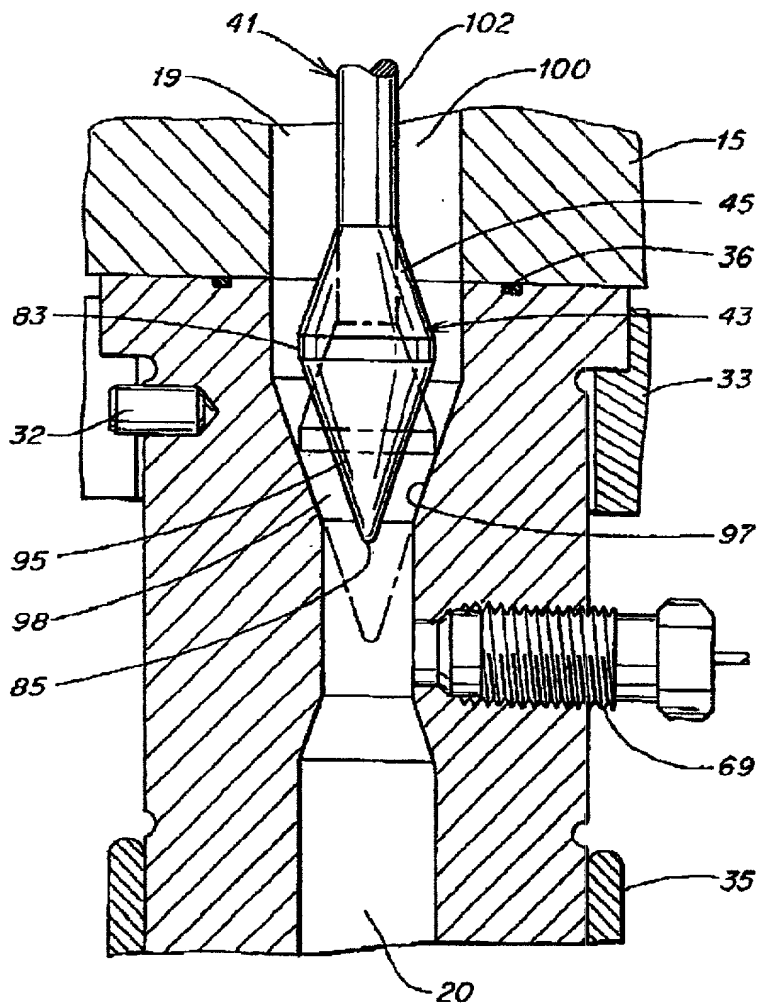


Fig. 7

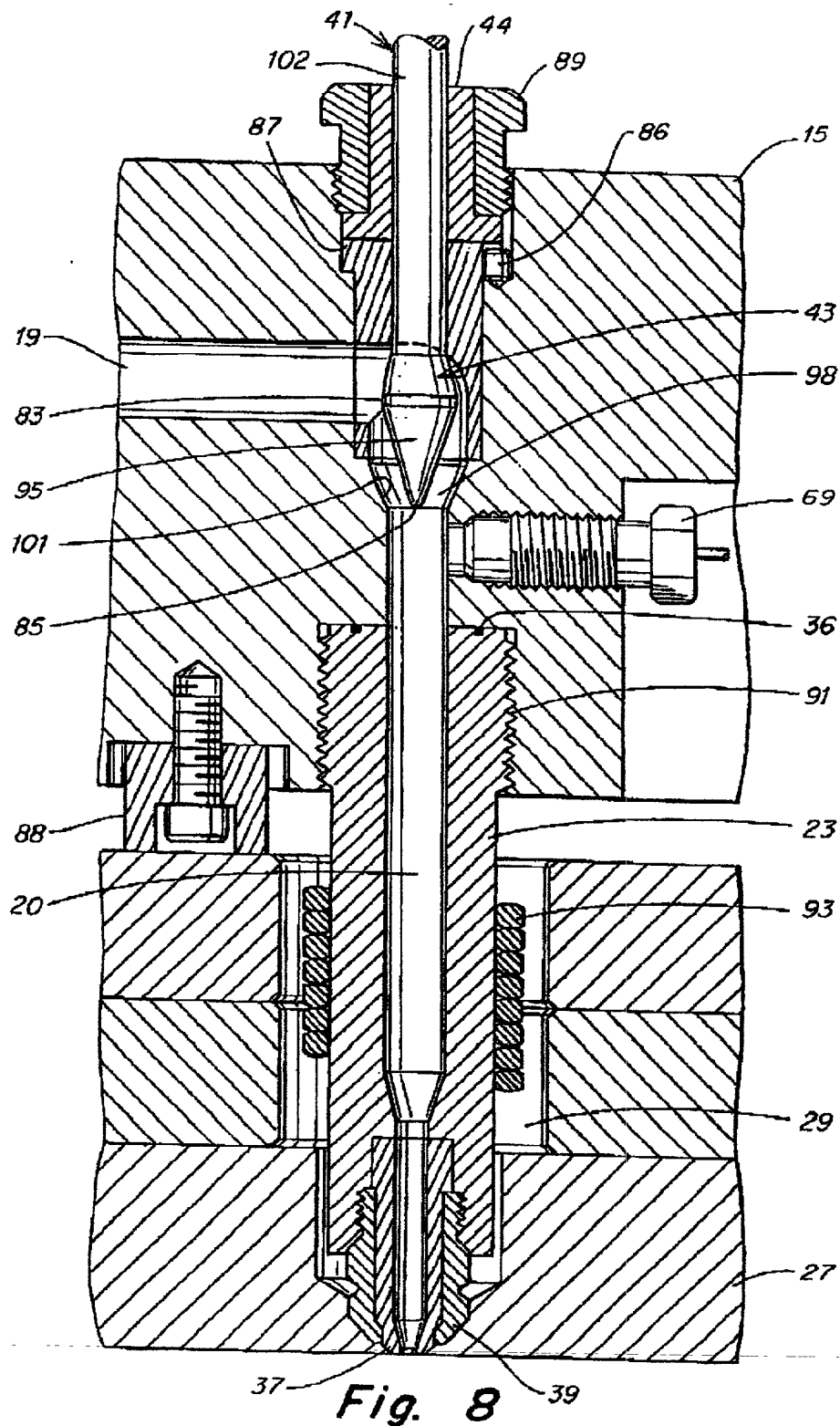


Fig. 8

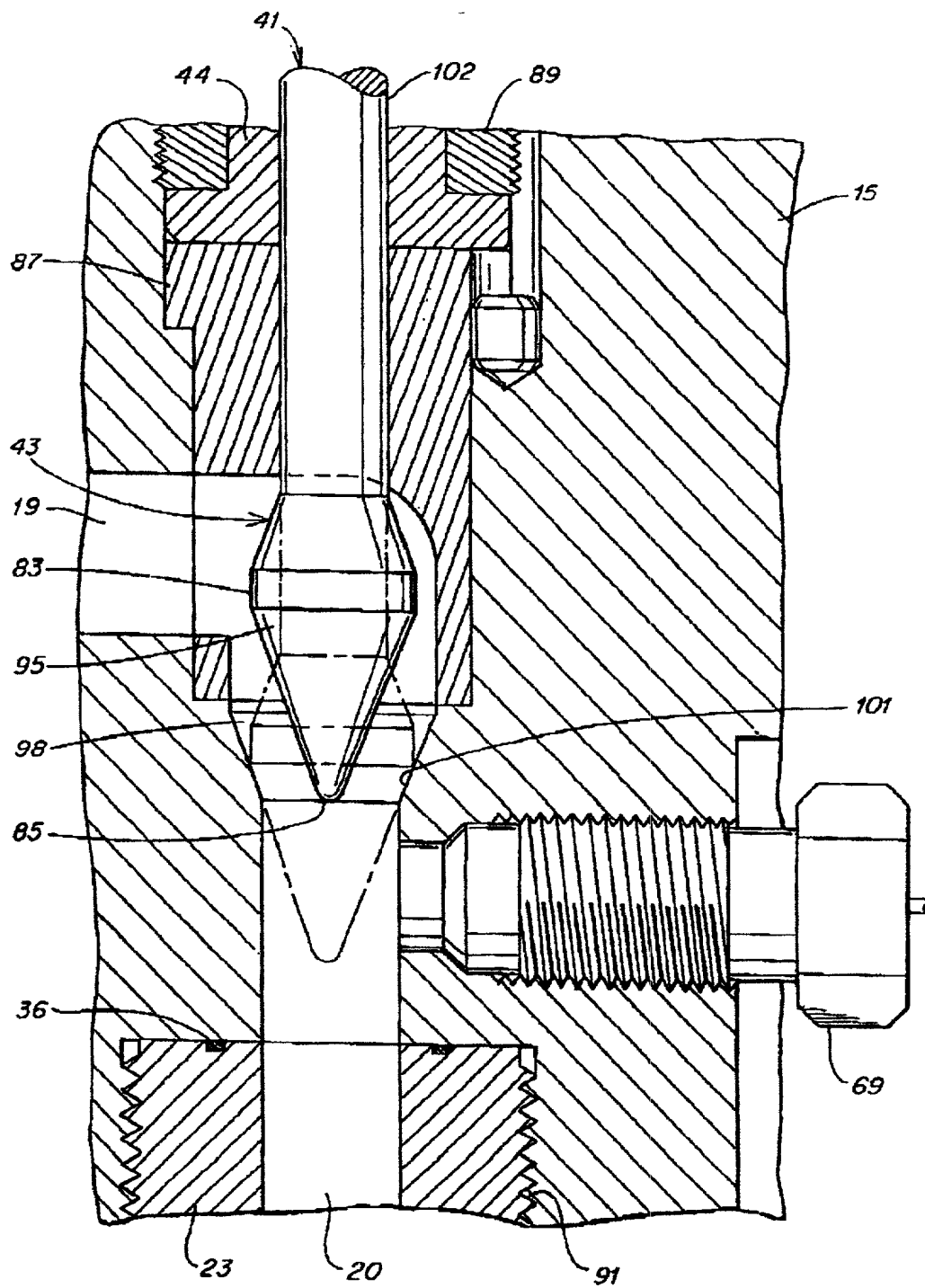


Fig. 9

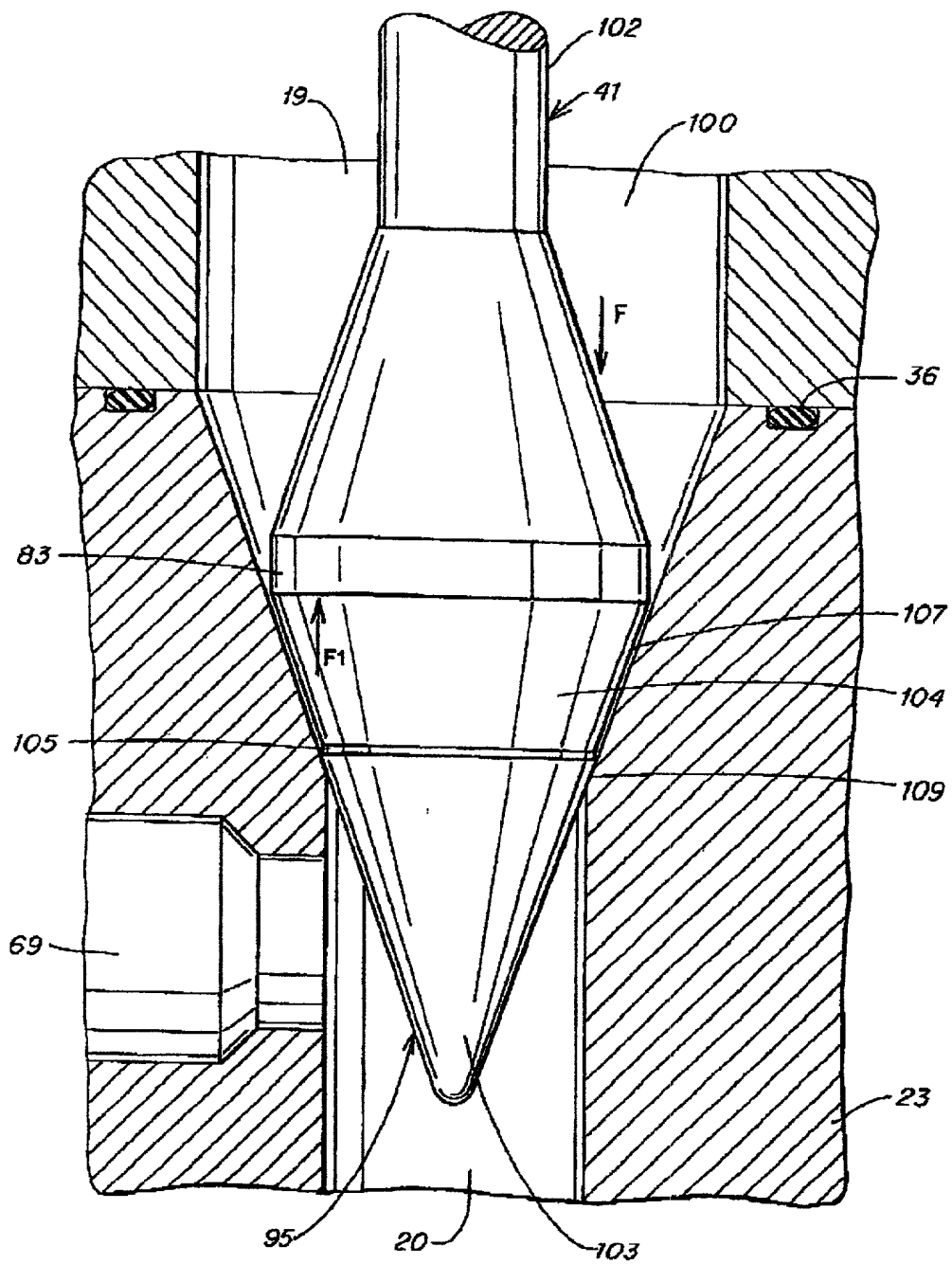


Fig. 10

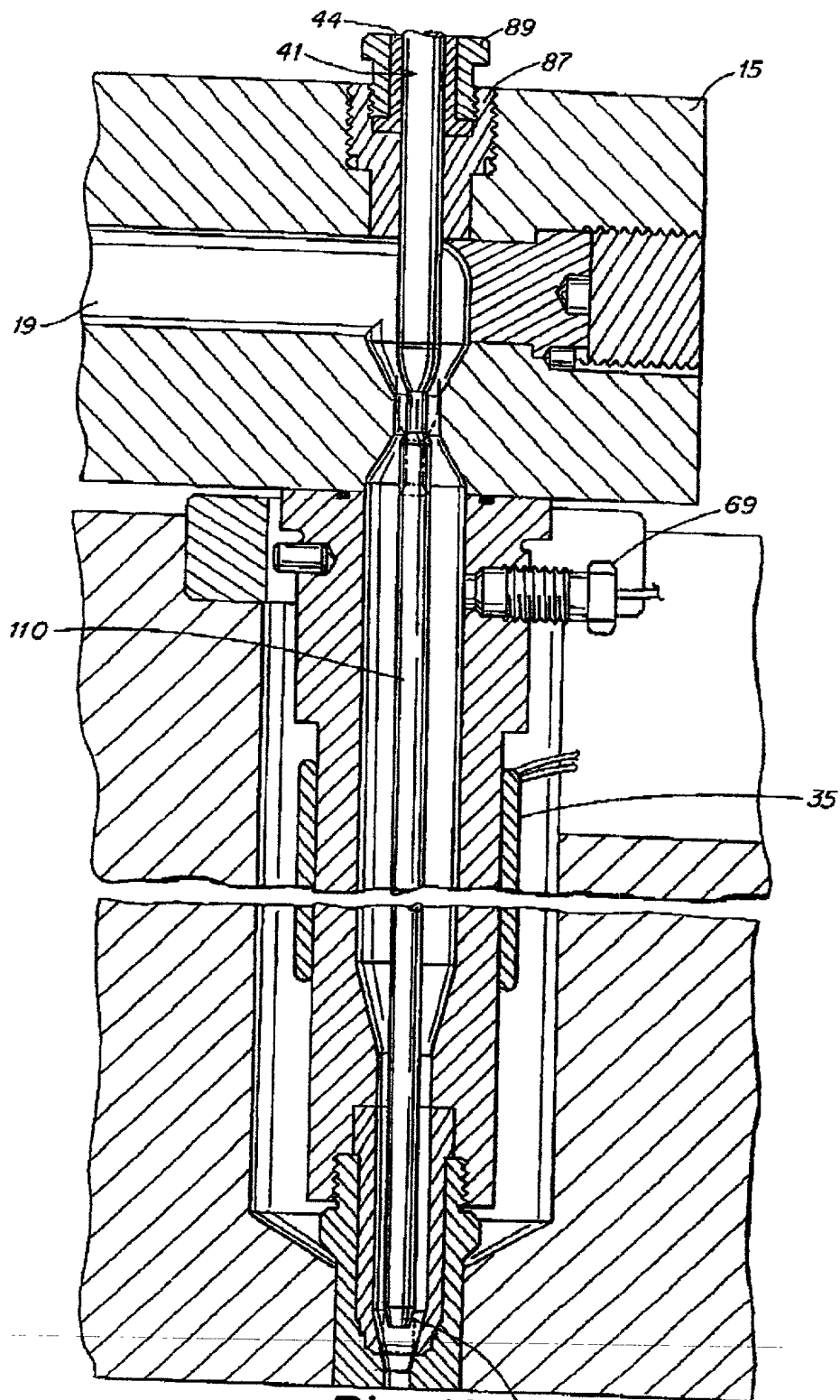


Fig. 11 112

112 110 35 69 87 89 44 41 19 15

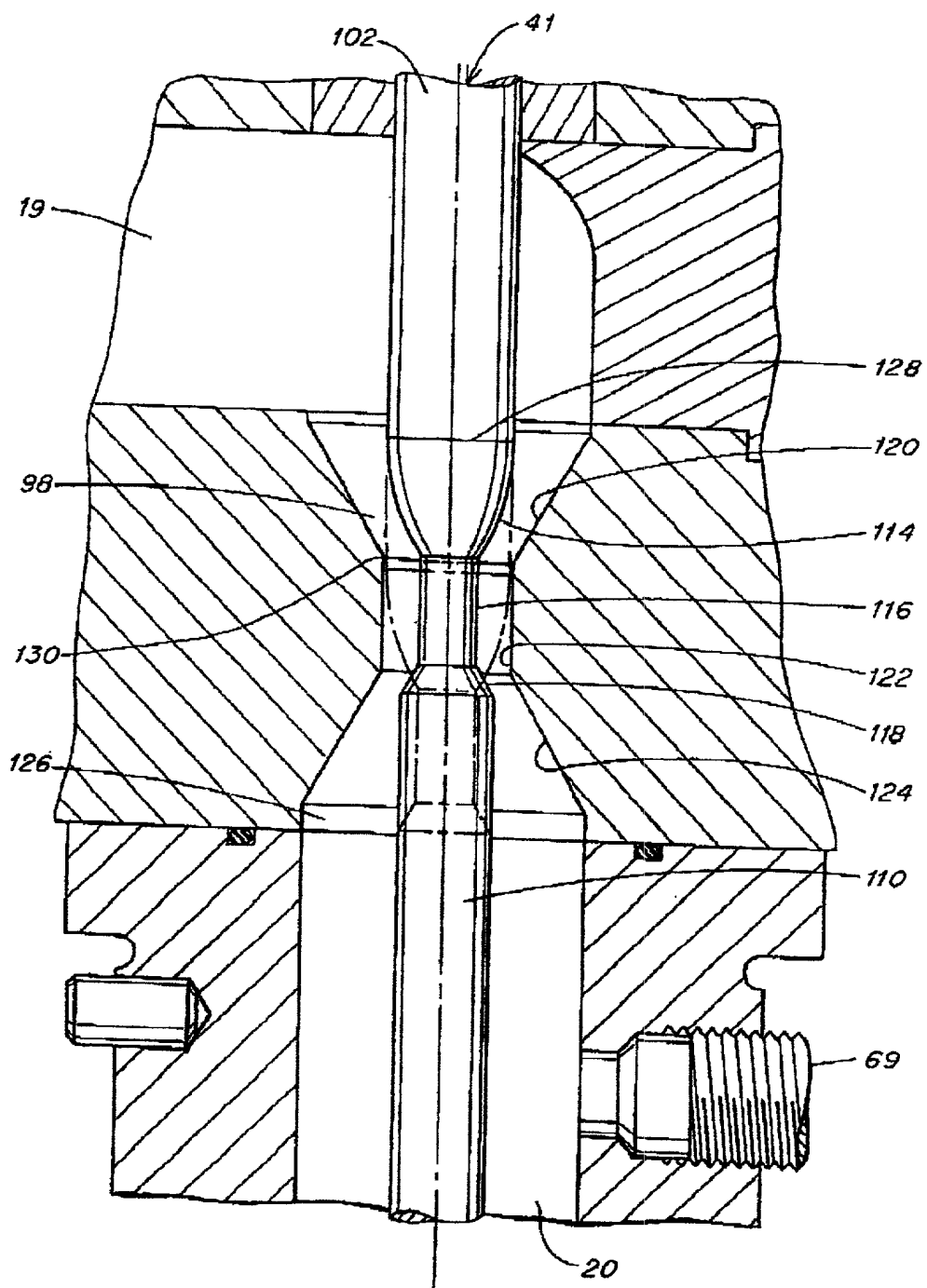


Fig. 12

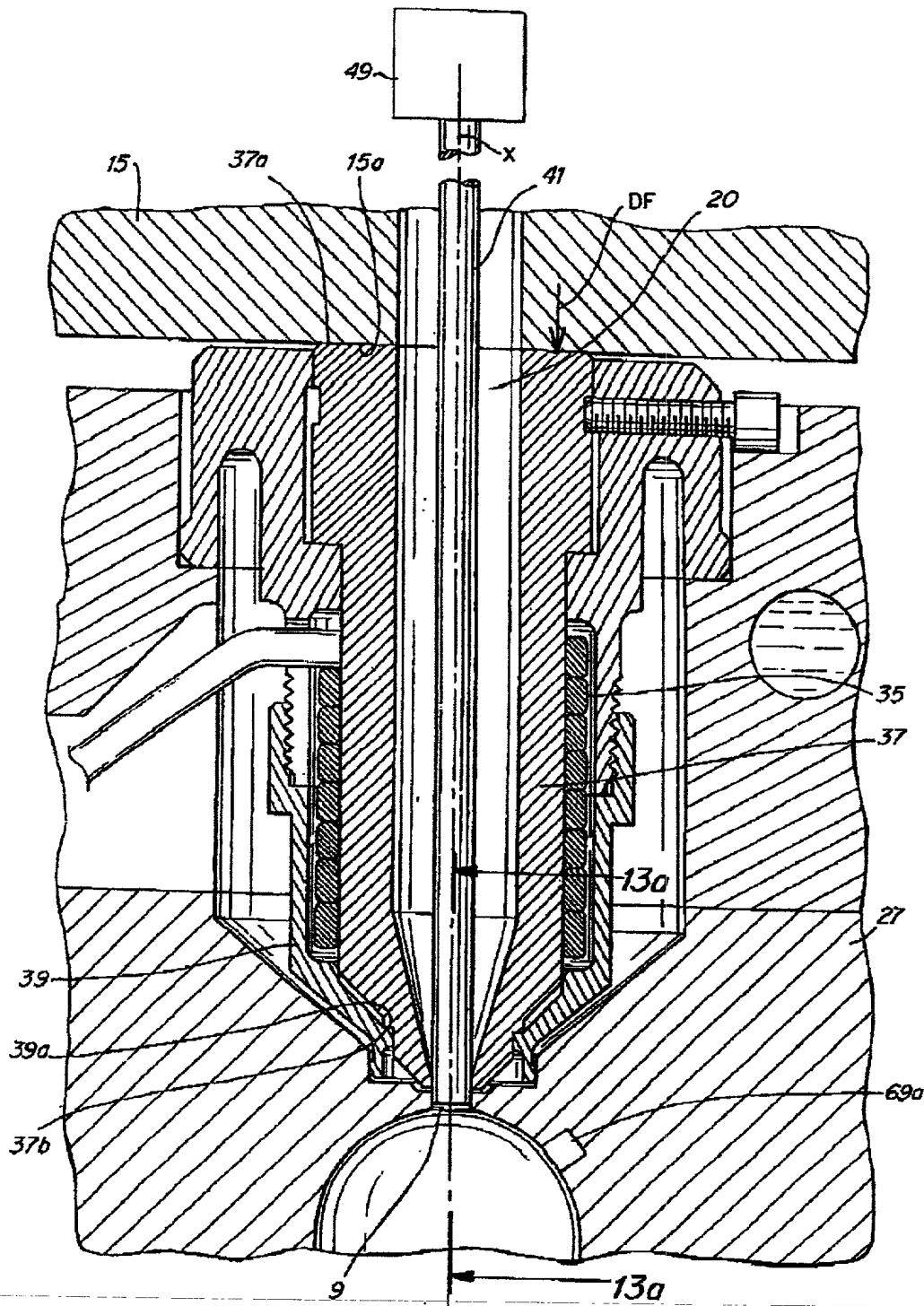


Fig. 13

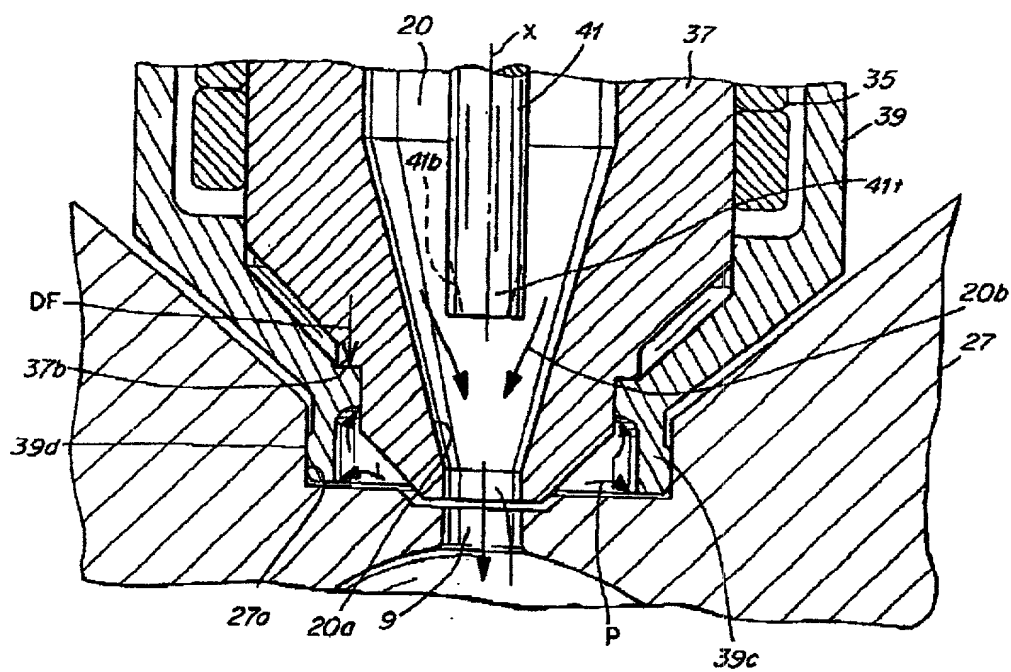


Fig. 13a

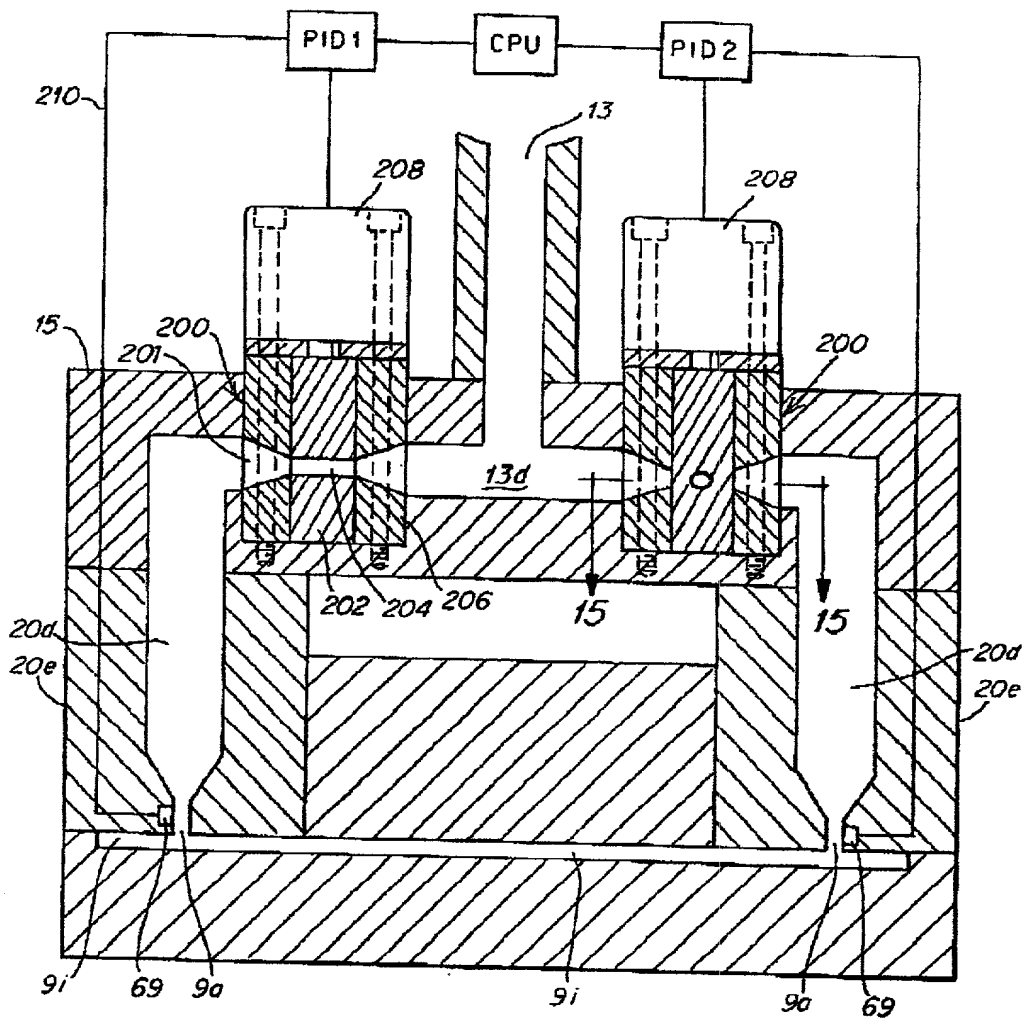


Fig. 14

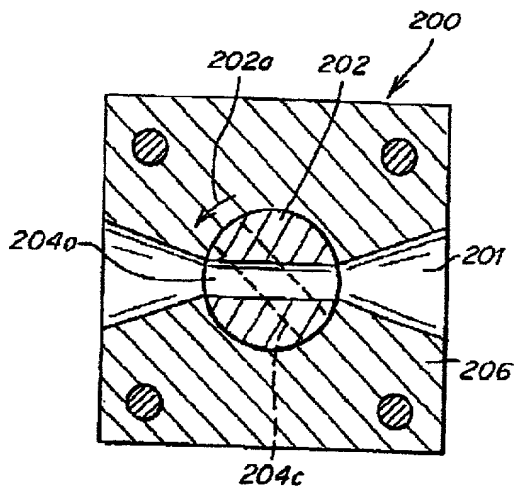


Fig. 15

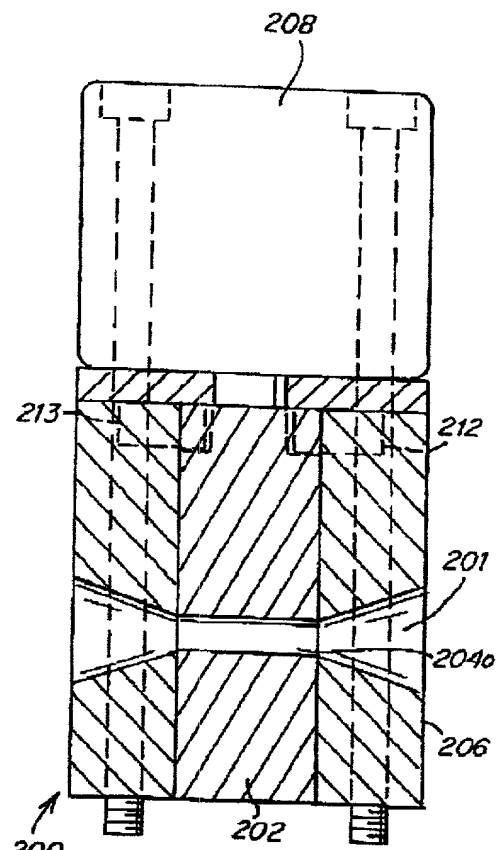


Fig. 16

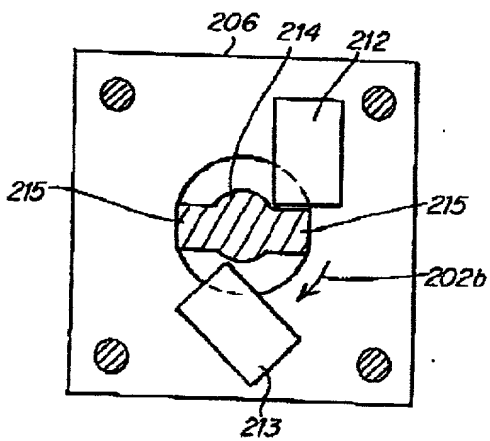


Fig. 17

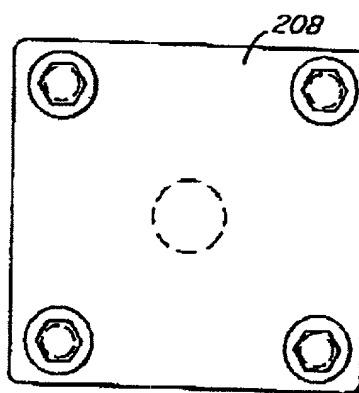


Fig. 18

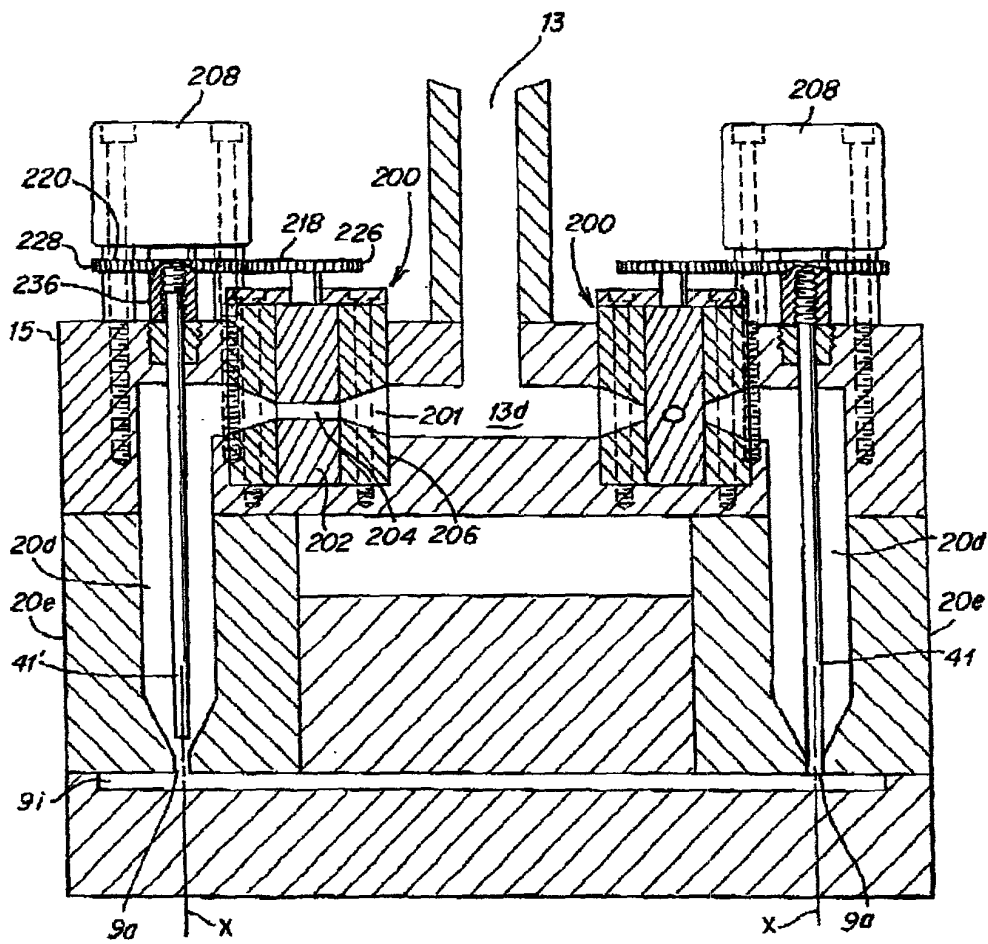


Fig. 19

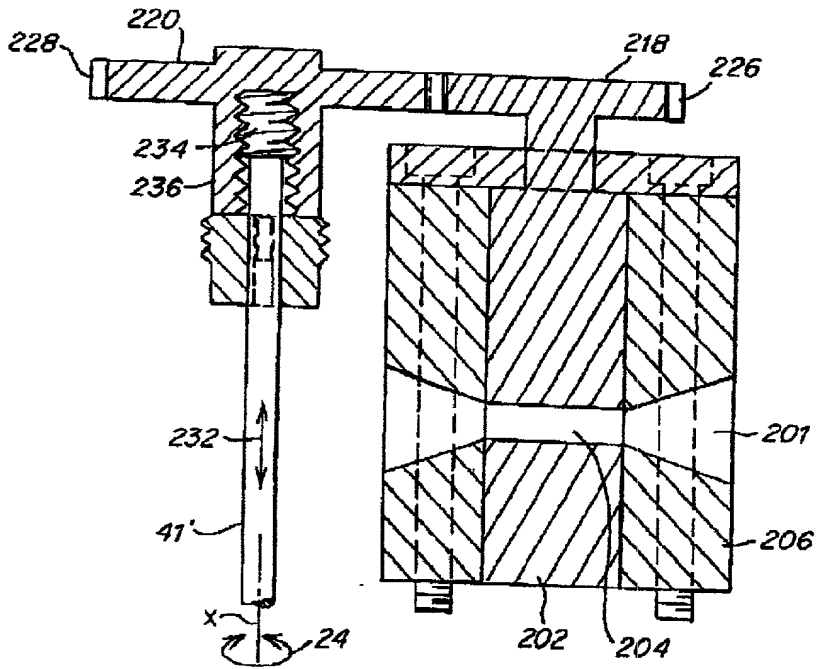


Fig. 20

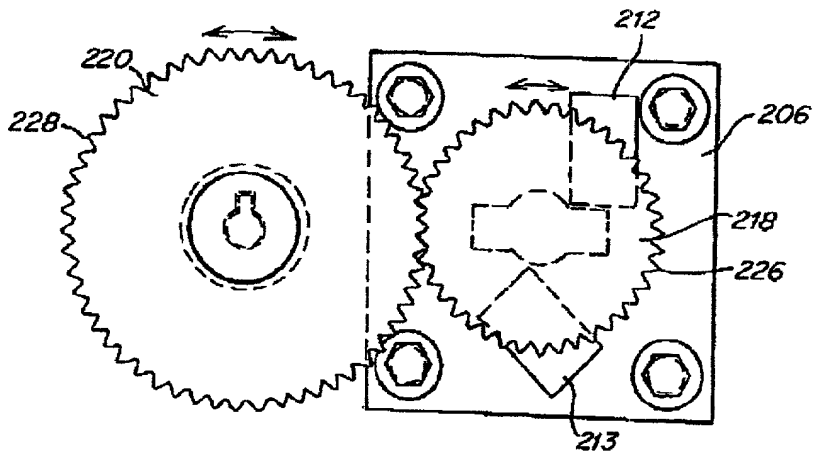


Fig. 21

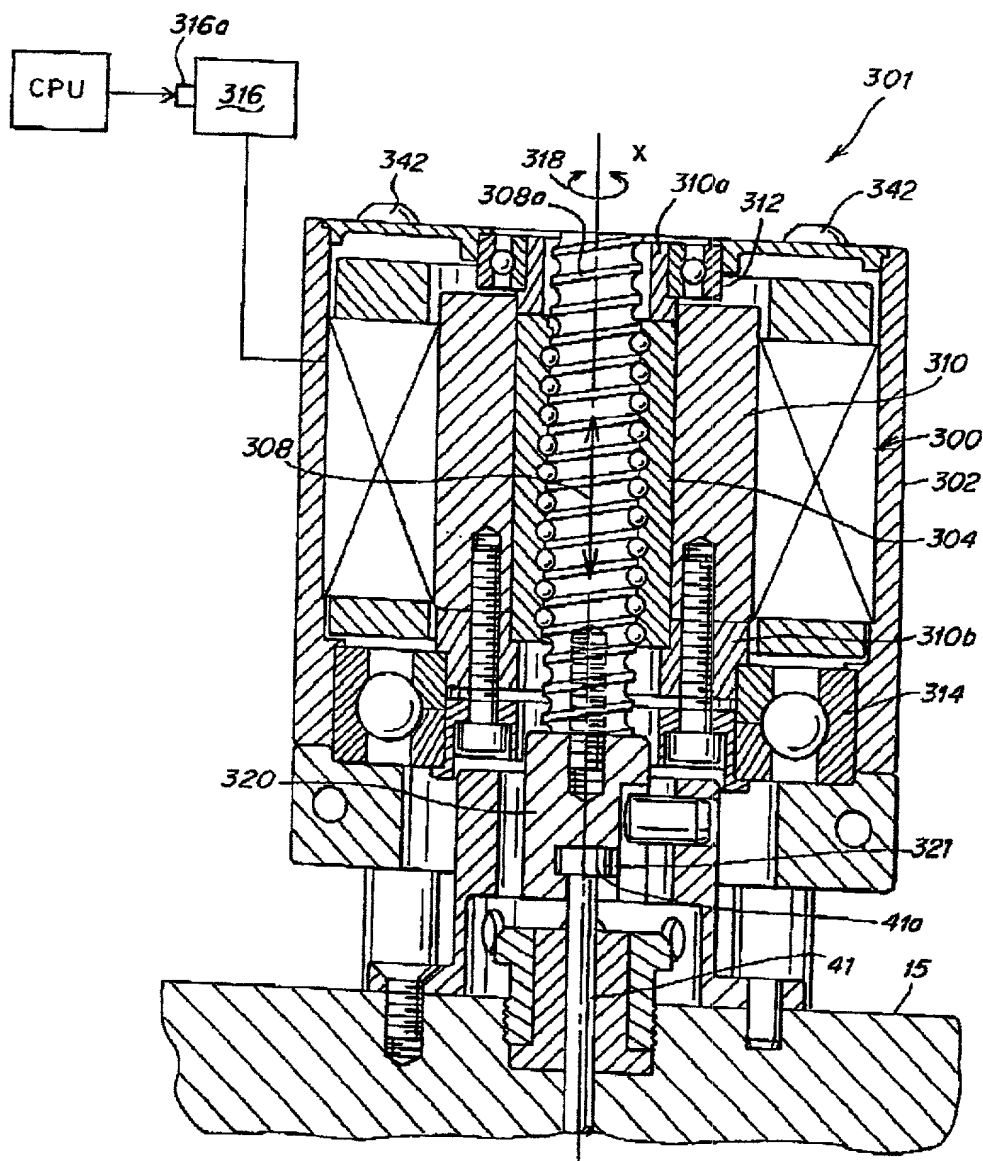


Fig. 22

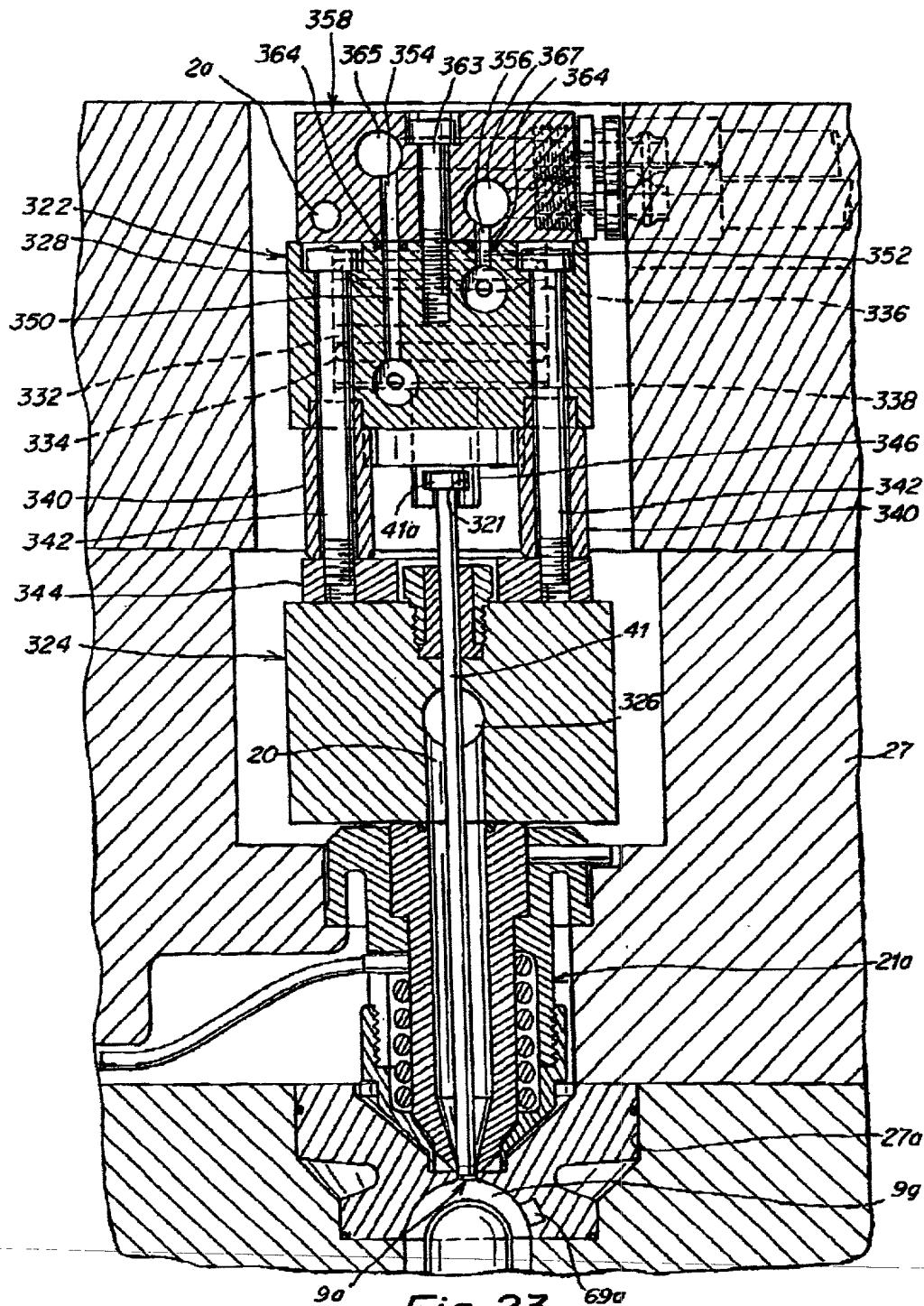


Fig. 23

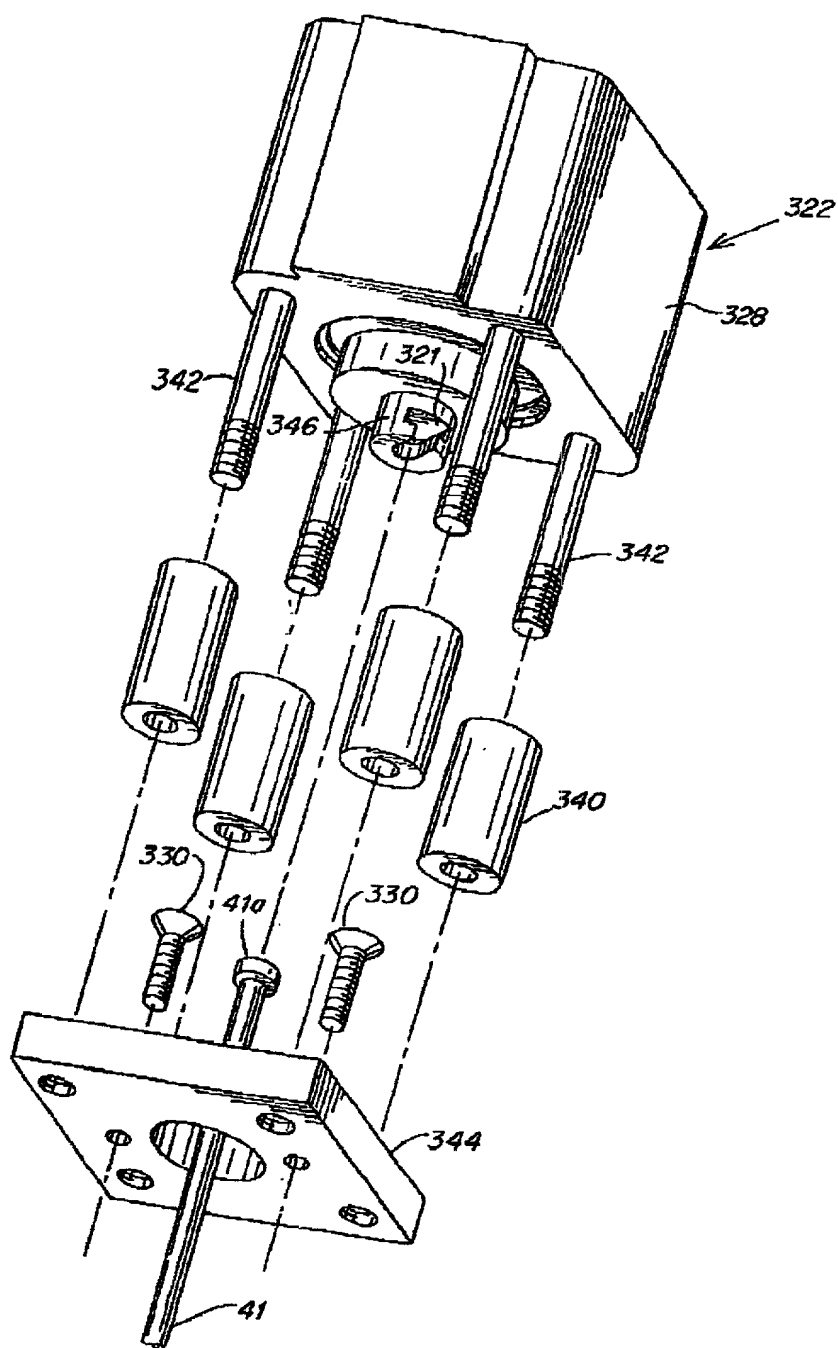


Fig 24

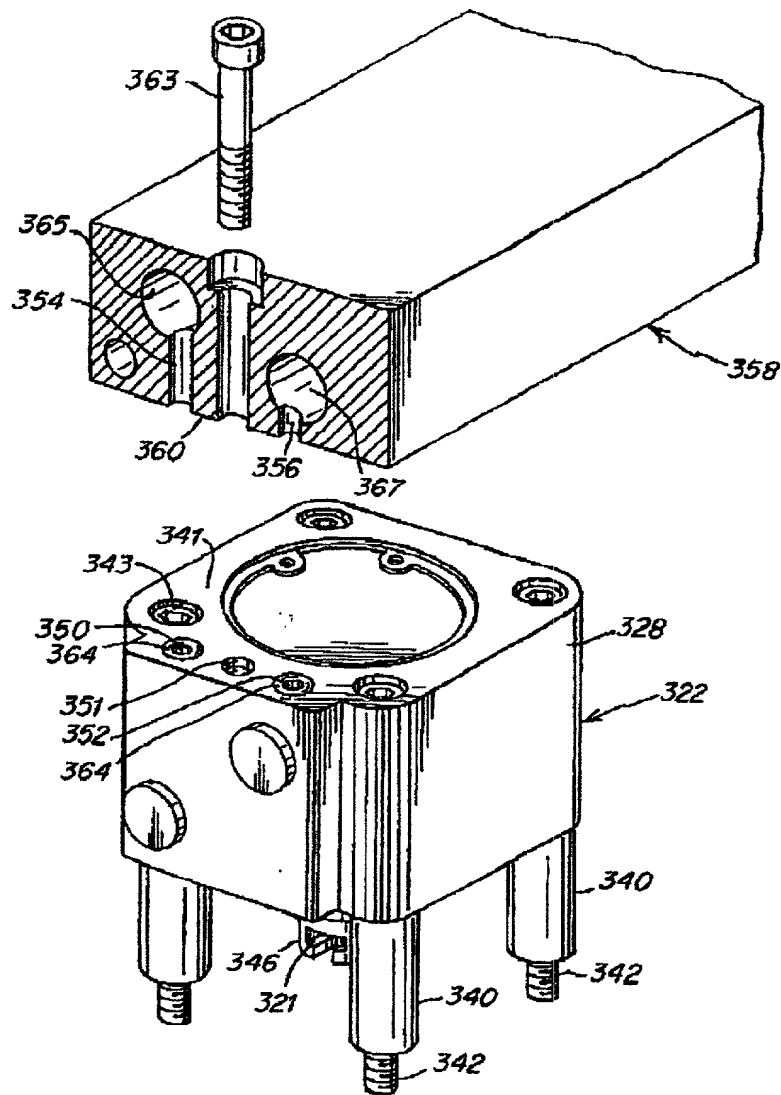


Fig. 25

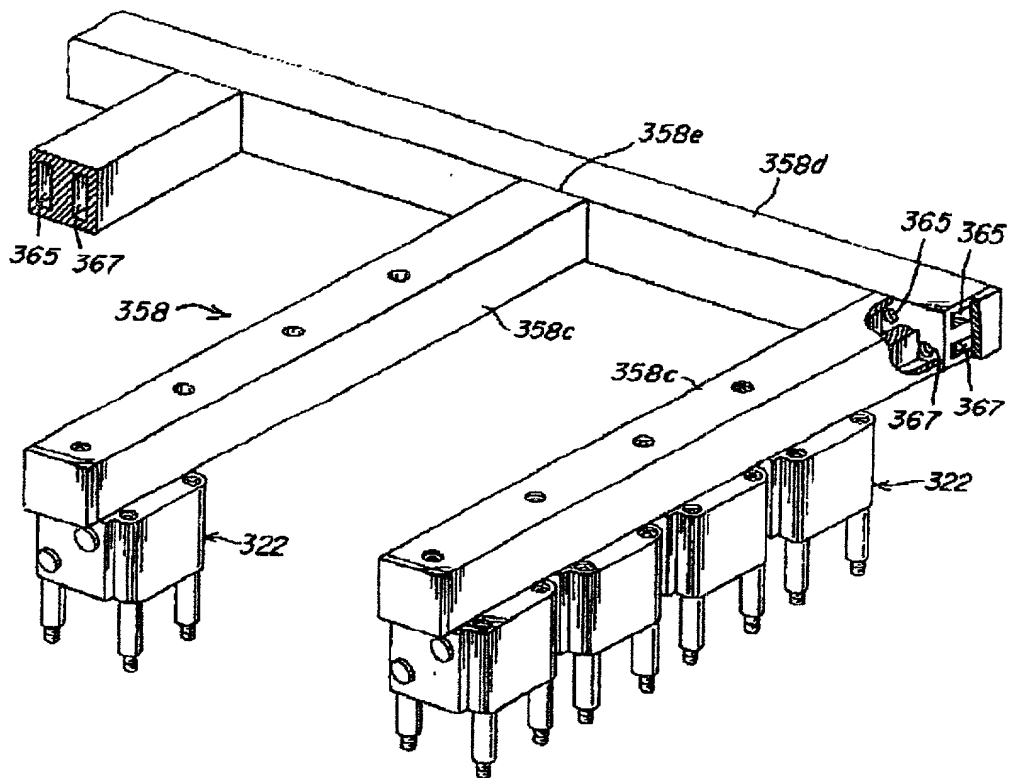


Fig. 26

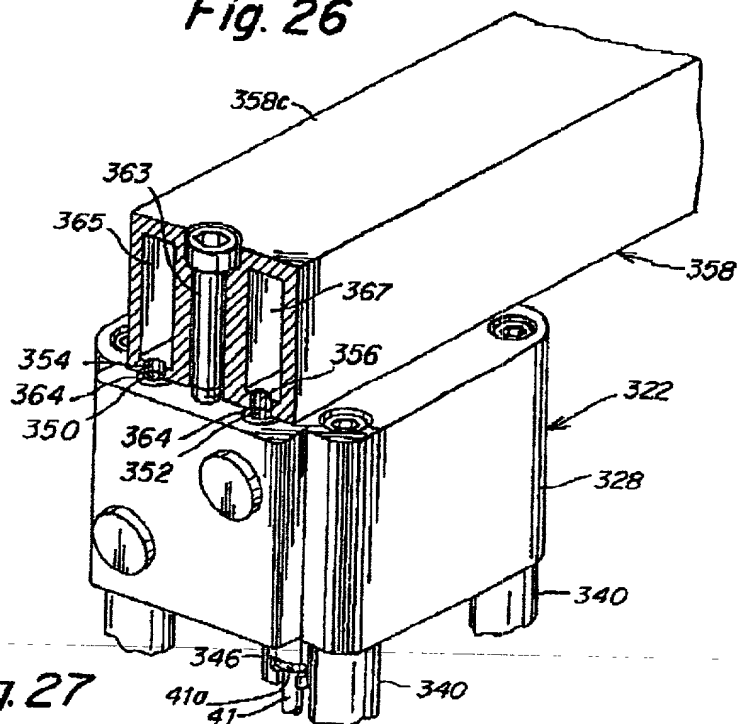


Fig. 27

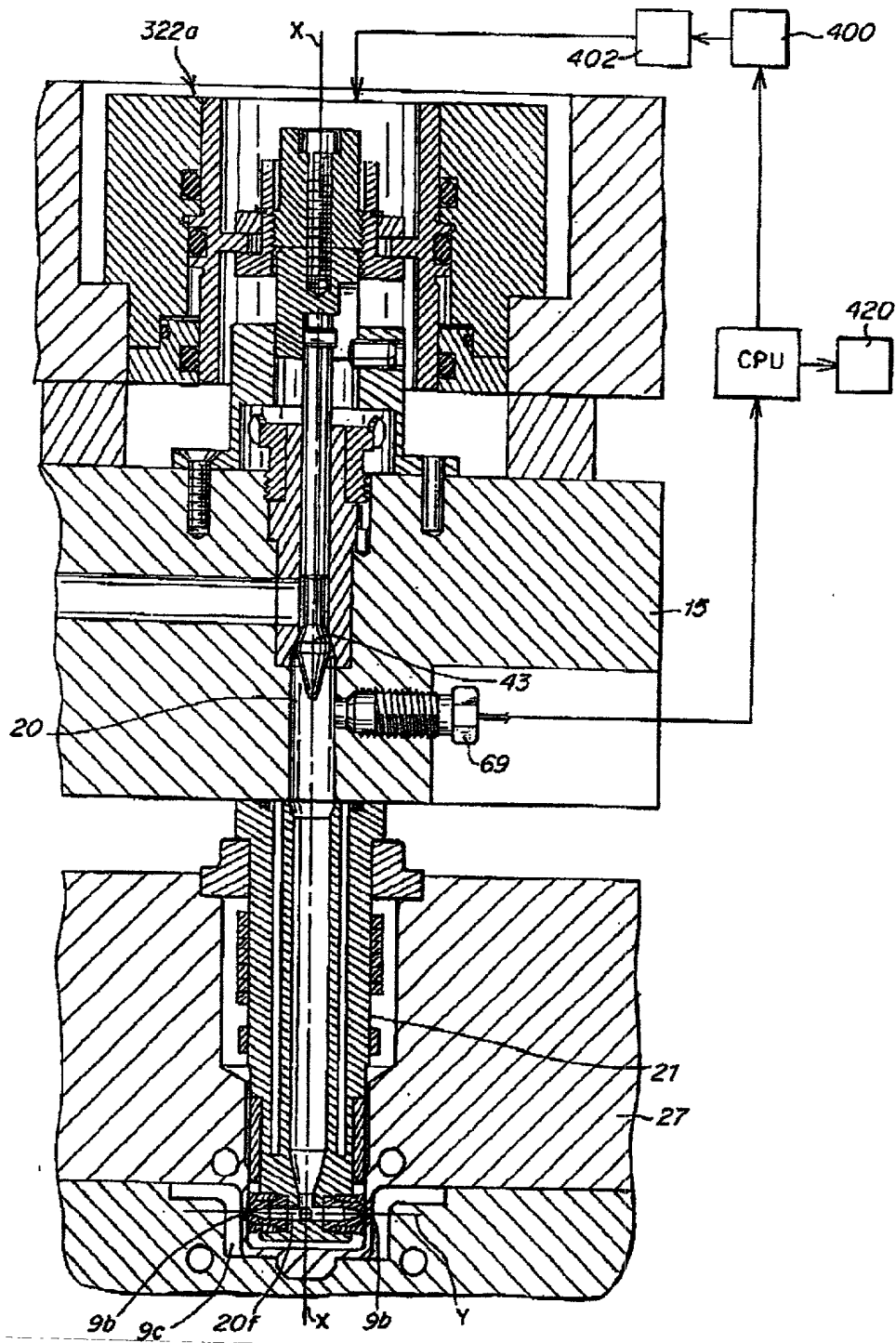


Fig. 29

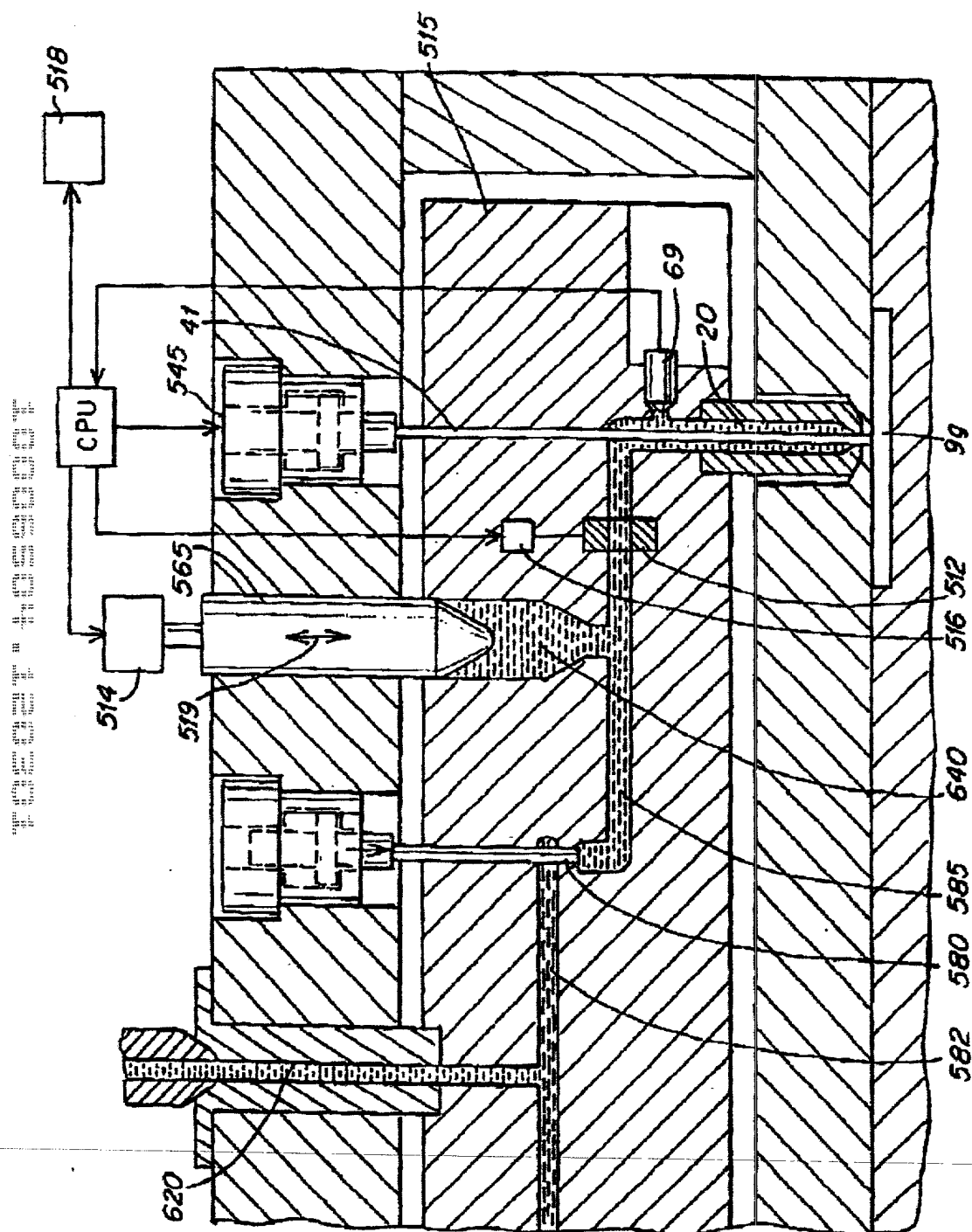


Fig. 37

FIG. 32 is a cross-sectional view of a wellbore completion assembly, taken along line 32-32 of FIG. 1, showing a wellbore 170, a casing 176, a cement sheath 177, and a completion assembly 700. The completion assembly 700 includes a central conduit 710, a filter 720, and a packer 730. The central conduit 710 is surrounded by a filter 720, which is in turn surrounded by a packer 730. The packer 730 is positioned within the wellbore 170, and the filter 720 is positioned within the casing 176. The central conduit 710 is connected to a wellhead 740. The wellhead 740 is connected to a wellbore 170. The wellbore 170 is surrounded by a casing 176, which is in turn surrounded by a cement sheath 177. The completion assembly 700 is positioned within the wellbore 170, and the filter 720 is positioned within the casing 176. The central conduit 710 is connected to a wellhead 740. The wellhead 740 is connected to a wellbore 170. The wellbore 170 is surrounded by a casing 176, which is in turn surrounded by a cement sheath 177. The completion assembly 700 is positioned within the wellbore 170, and the filter 720 is positioned within the casing 176.

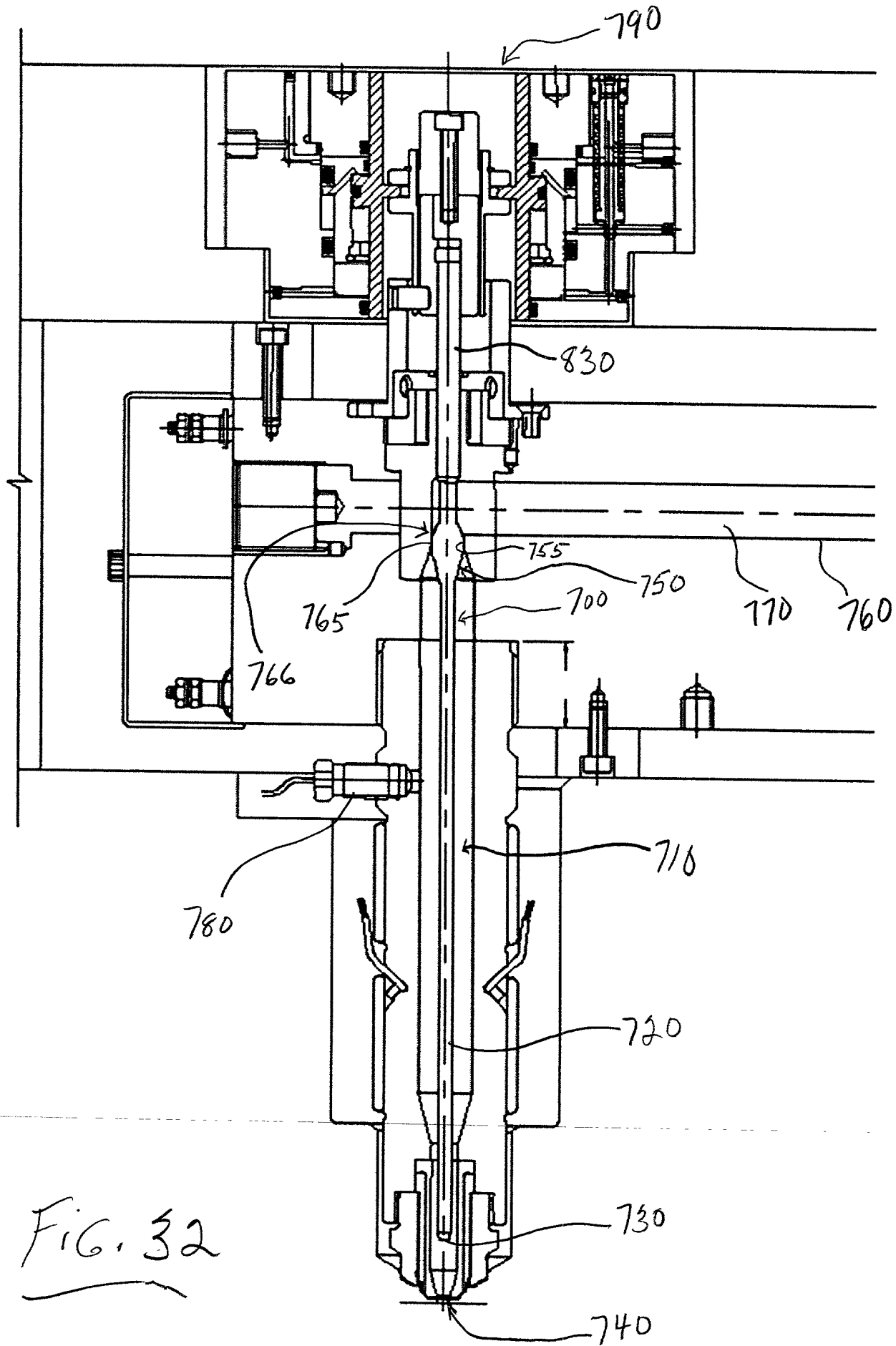


FIG. 32

FIG. 32A is a cross-sectional view of a device 700 in a closed state. The device 700 includes a housing 710 and a central shaft 755. A piston 765 is positioned within the shaft 755, and a spring 766 is located at the bottom of the shaft. The device 700 is shown in a cross-sectional view along a Z-axis. The housing 710 has a central opening 755. The piston 765 is a tapered component that fits within the opening 755. The spring 766 is a coiled spring located at the bottom of the shaft 755. The device 700 is shown in a closed state, where the piston 765 is at the bottom of the shaft 755, blocking the opening 755. The spring 766 is compressed. The housing 710 has a top flange 760 and a bottom flange 770. The central shaft 755 is a vertical shaft. The piston 765 is a tapered component that fits within the opening 755. The spring 766 is a coiled spring located at the bottom of the shaft 755. The device 700 is shown in a cross-sectional view along a Z-axis.

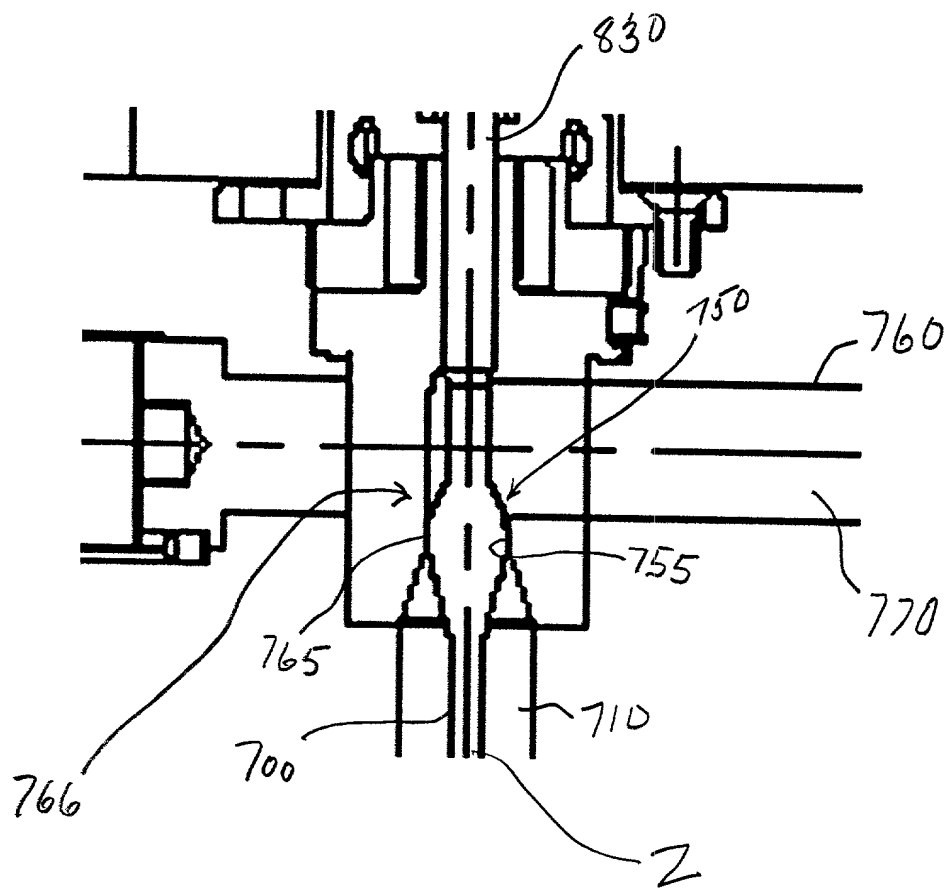


FIG. 32A

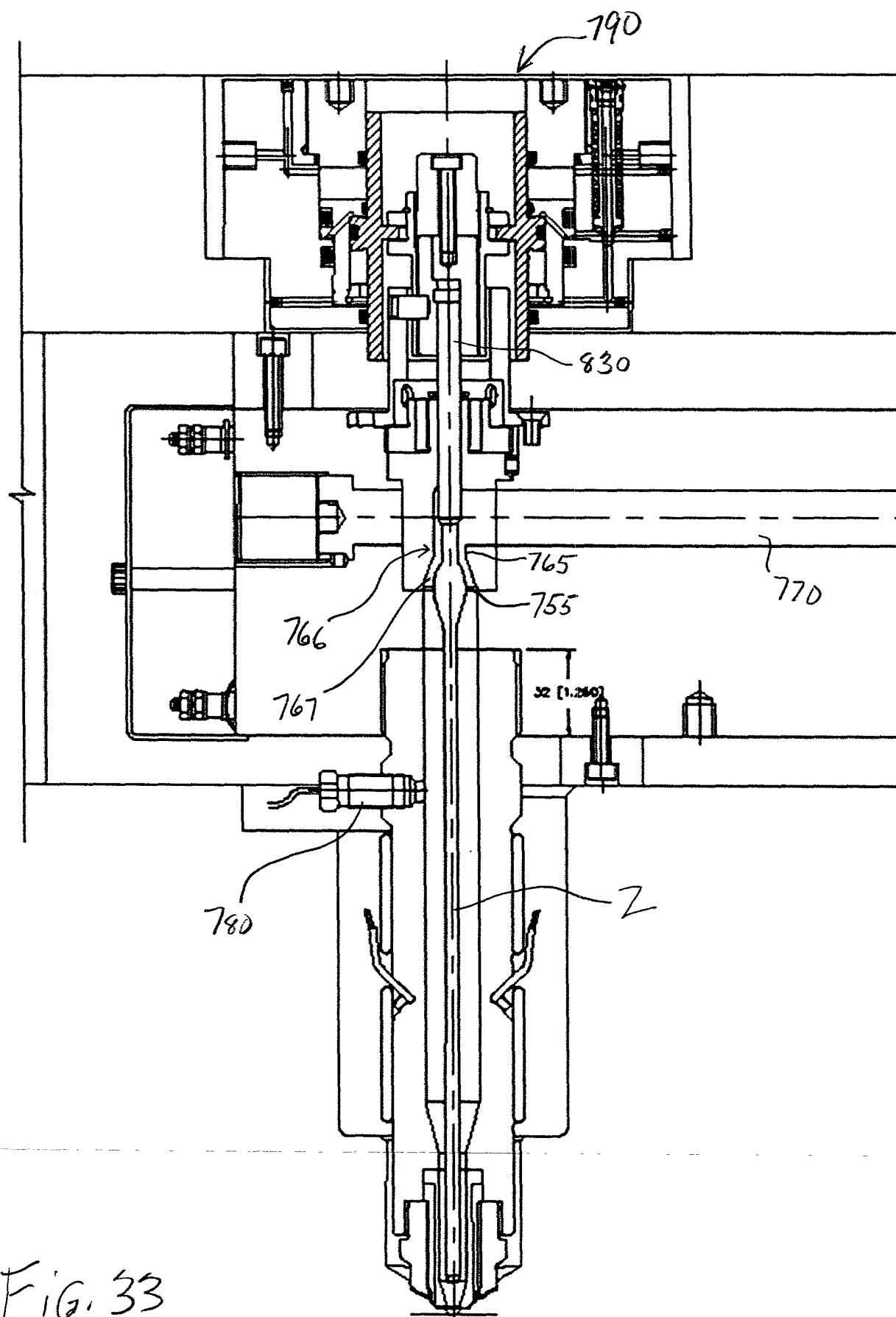


FIG. 33

FIG. 33A is a cross-sectional view of a device in a closed state. The device includes a central shaft 710, a sleeve 755, and a housing 765. The sleeve 755 is positioned around the shaft 710 and has a series of teeth 766 on its outer surface. The housing 765 is positioned around the sleeve 755 and has a series of teeth 767 on its inner surface. The teeth 766 and 767 are in mesh with each other. A spring 830 is positioned around the shaft 710 and is in contact with the sleeve 755. The spring 830 is in a compressed state, pushing the sleeve 755 towards the housing 765. The device is in a closed state because the sleeve 755 is in contact with the housing 765.

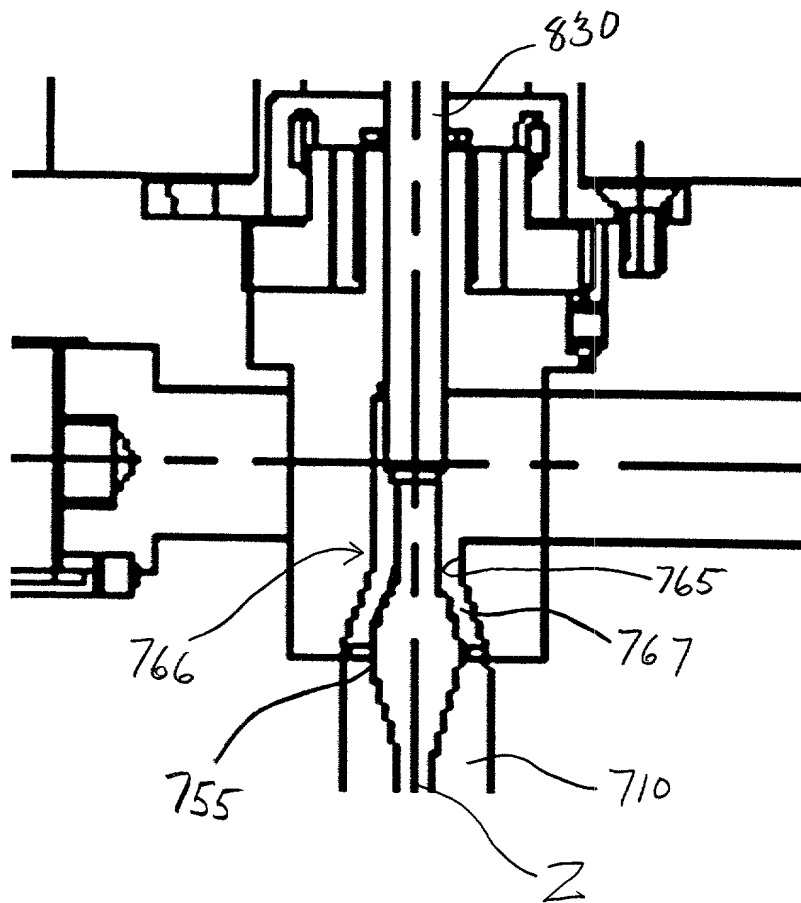
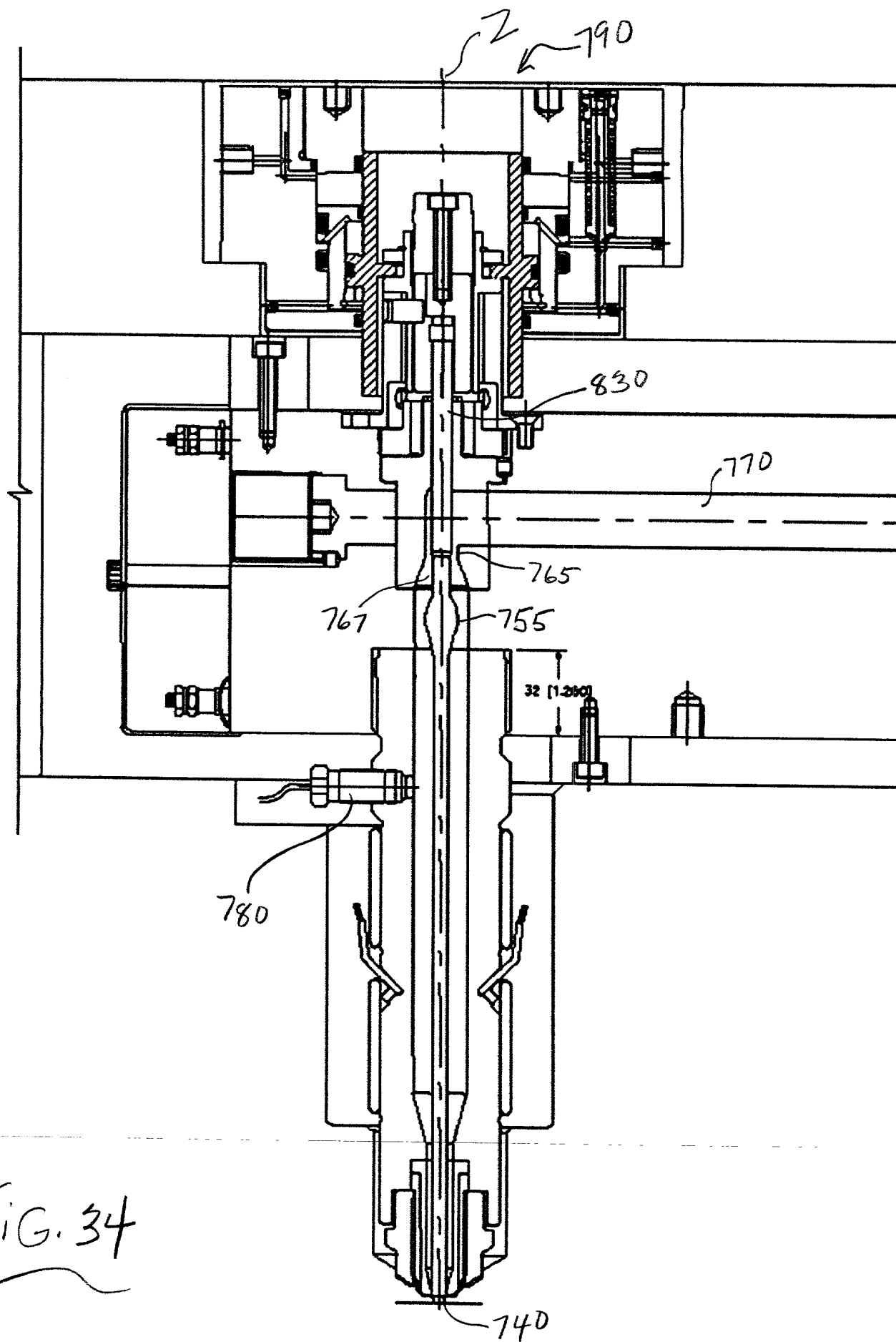


FIG. 33A



-740

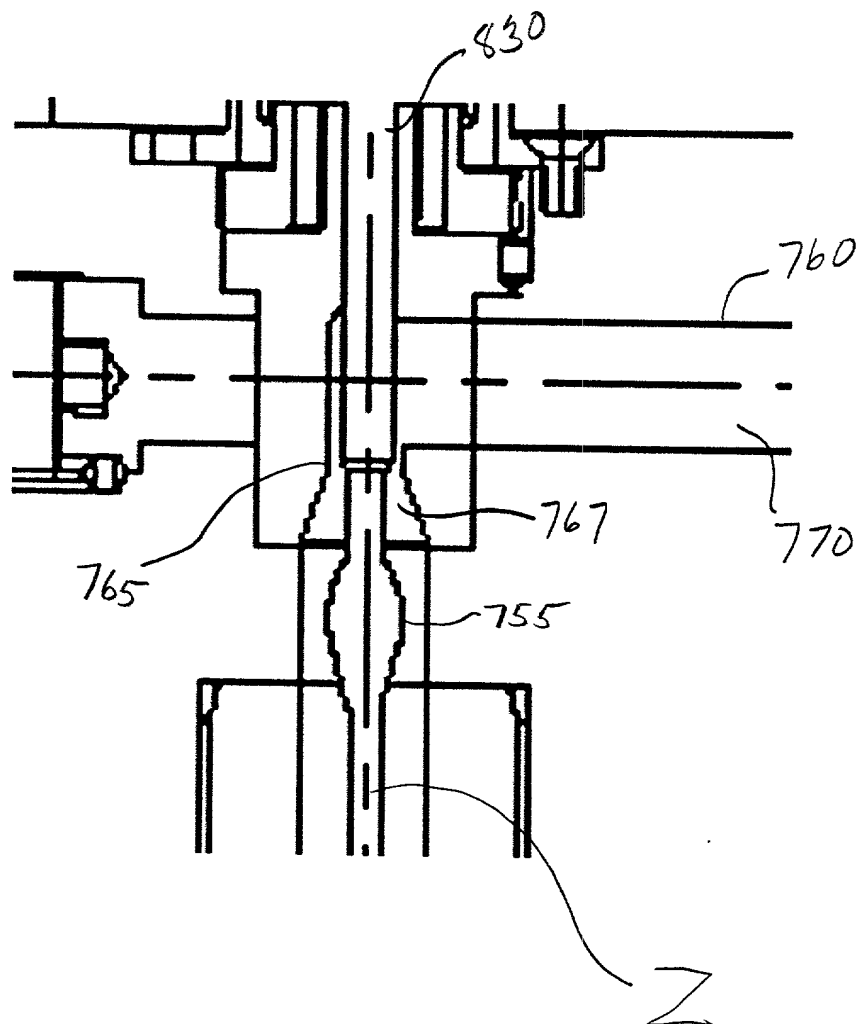


FIG. 34A

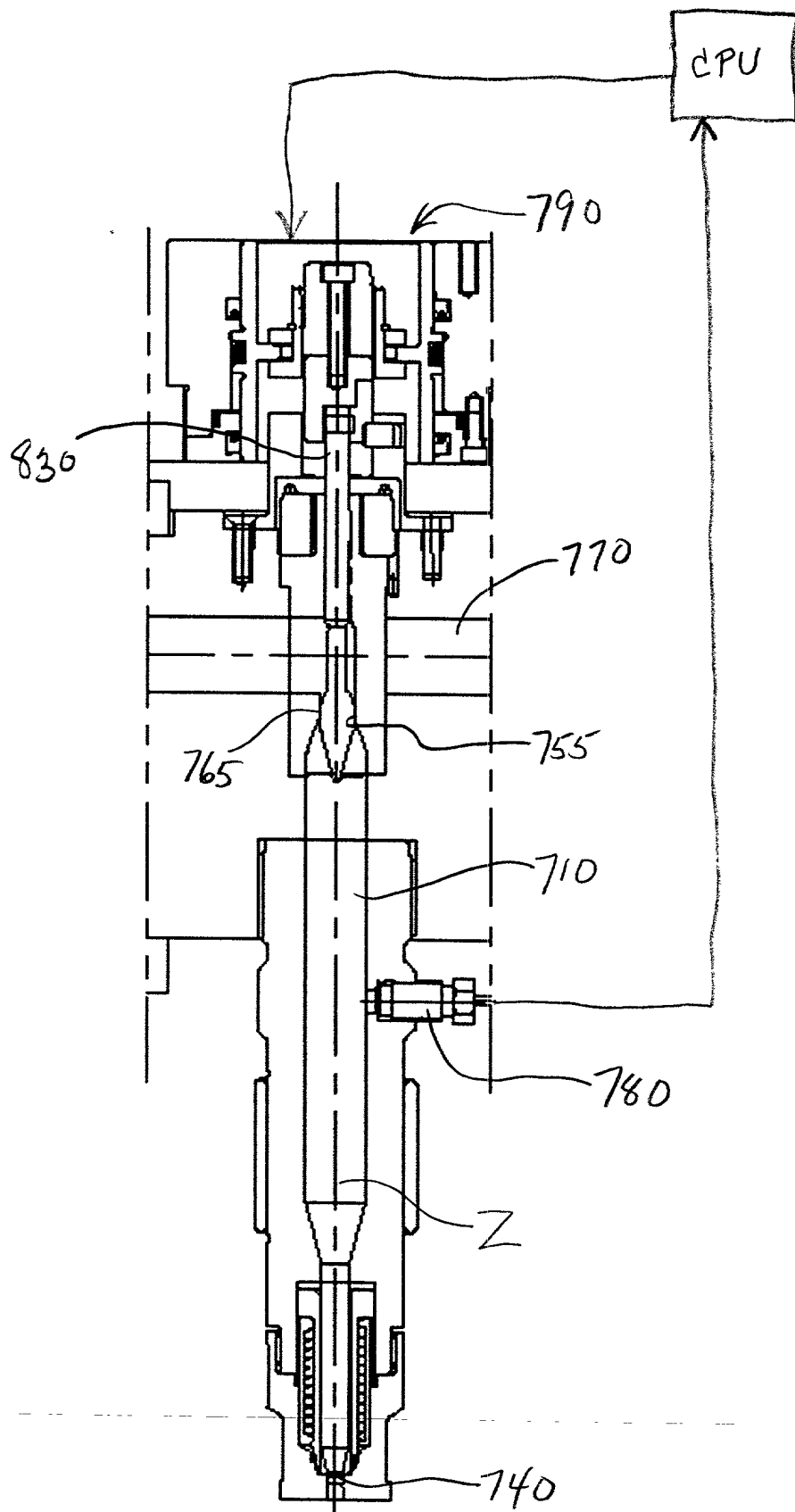


FIG. 35

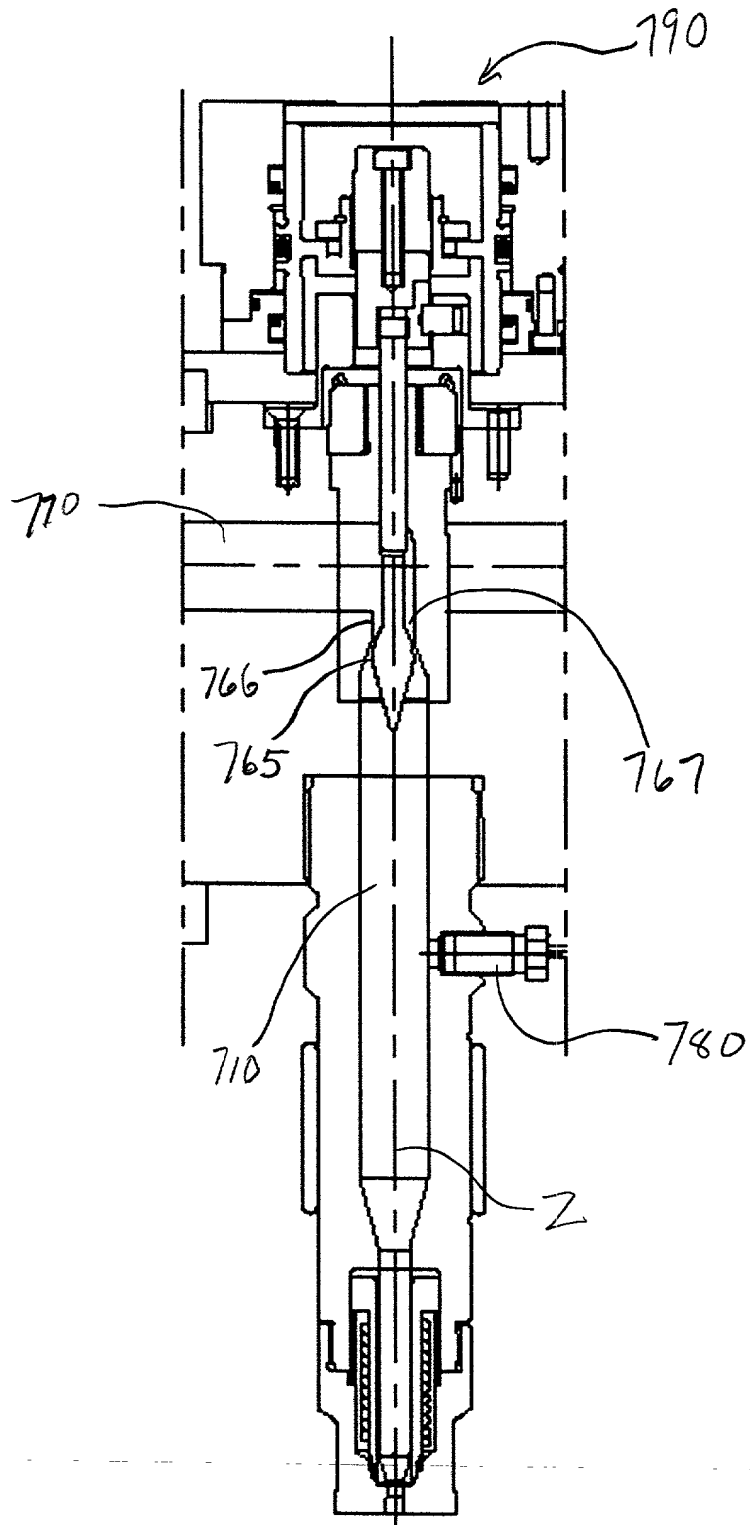


FIG. 36

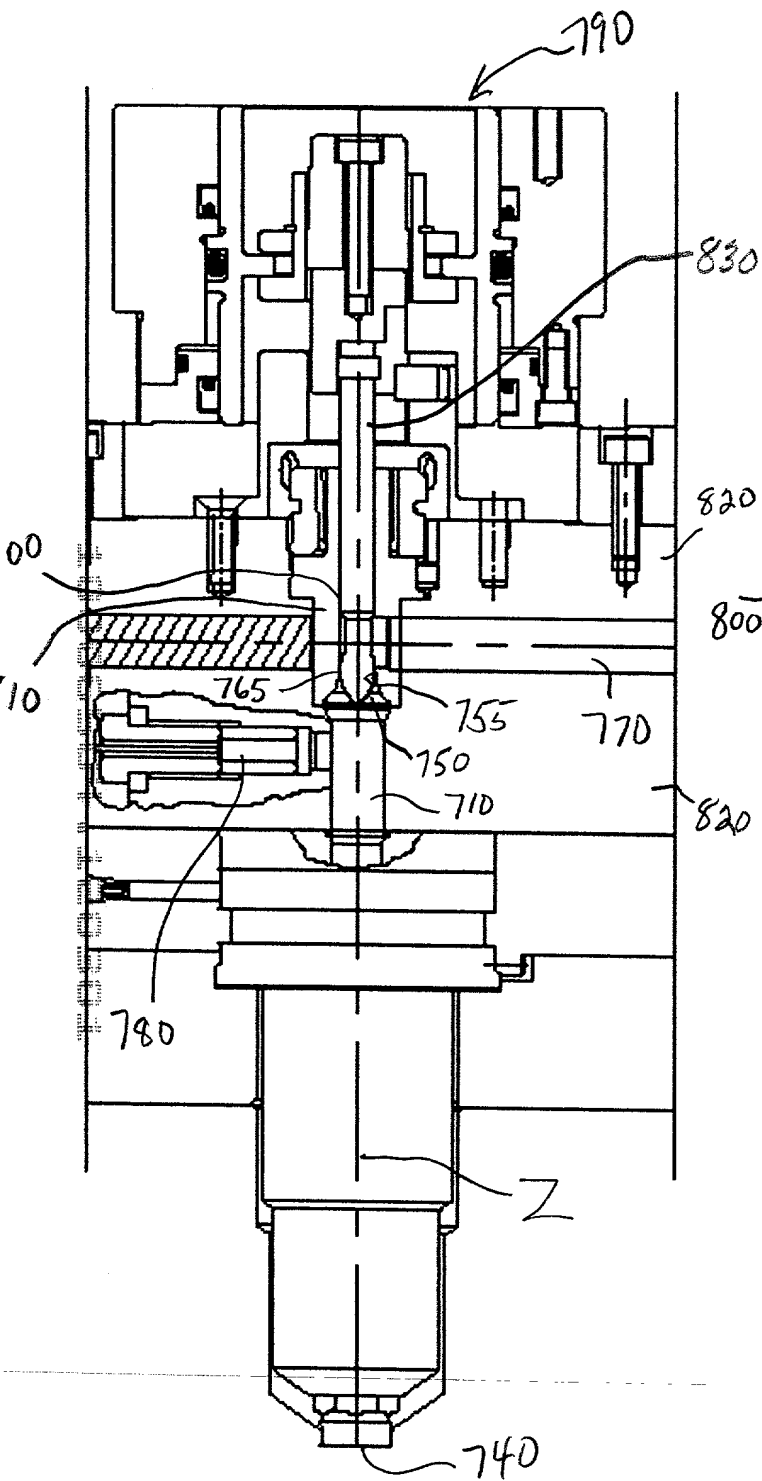


FIG. 37

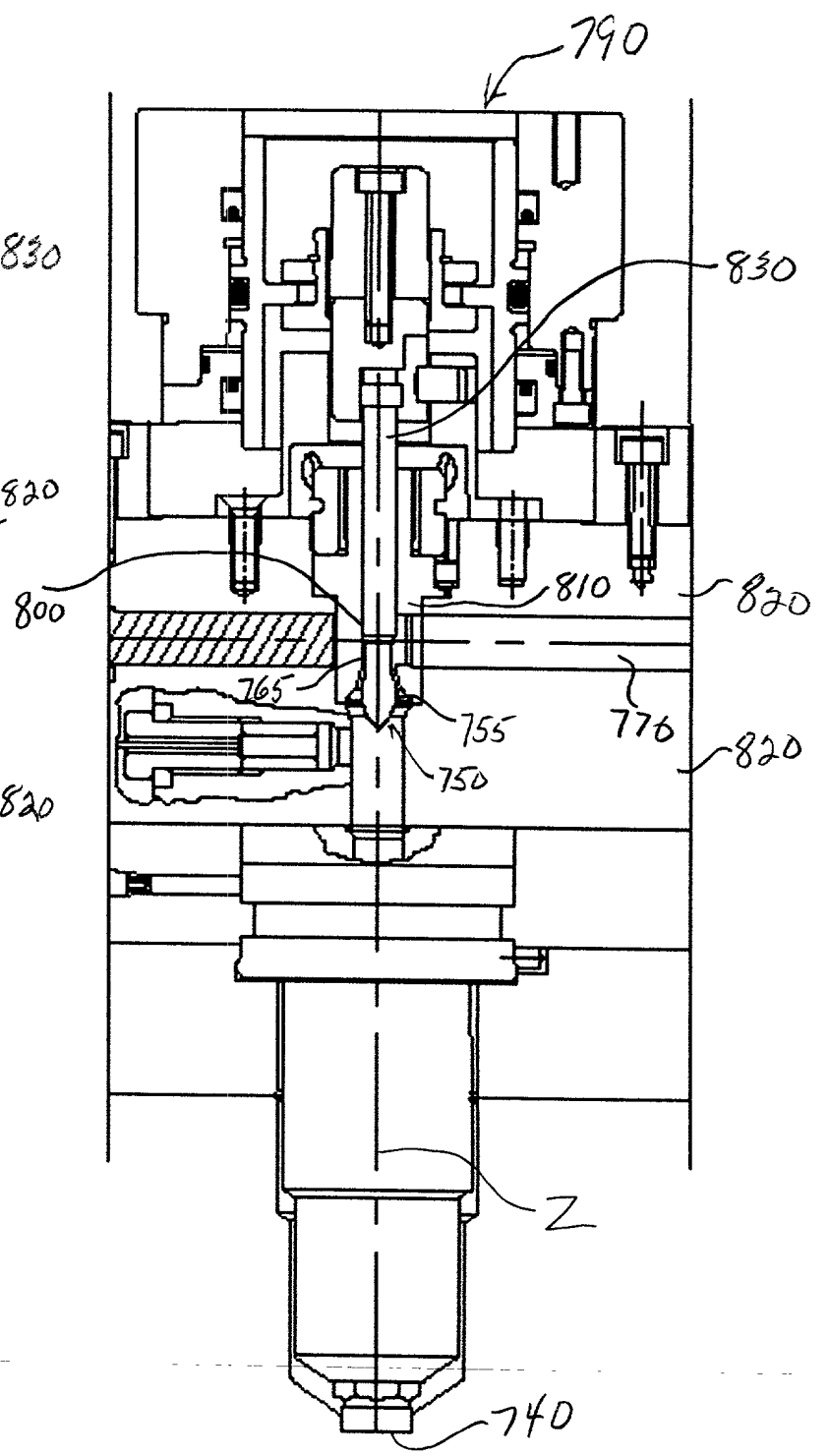


FIG. 38

FIG. 37A is a cross-sectional view of a device in a first state. The device includes a substrate 710, a layer 750, a layer 765, a layer 810, a layer 800, a layer 820, a layer 830, and a layer 850. The device is shown in a cross-sectional view along a line Z-Z.

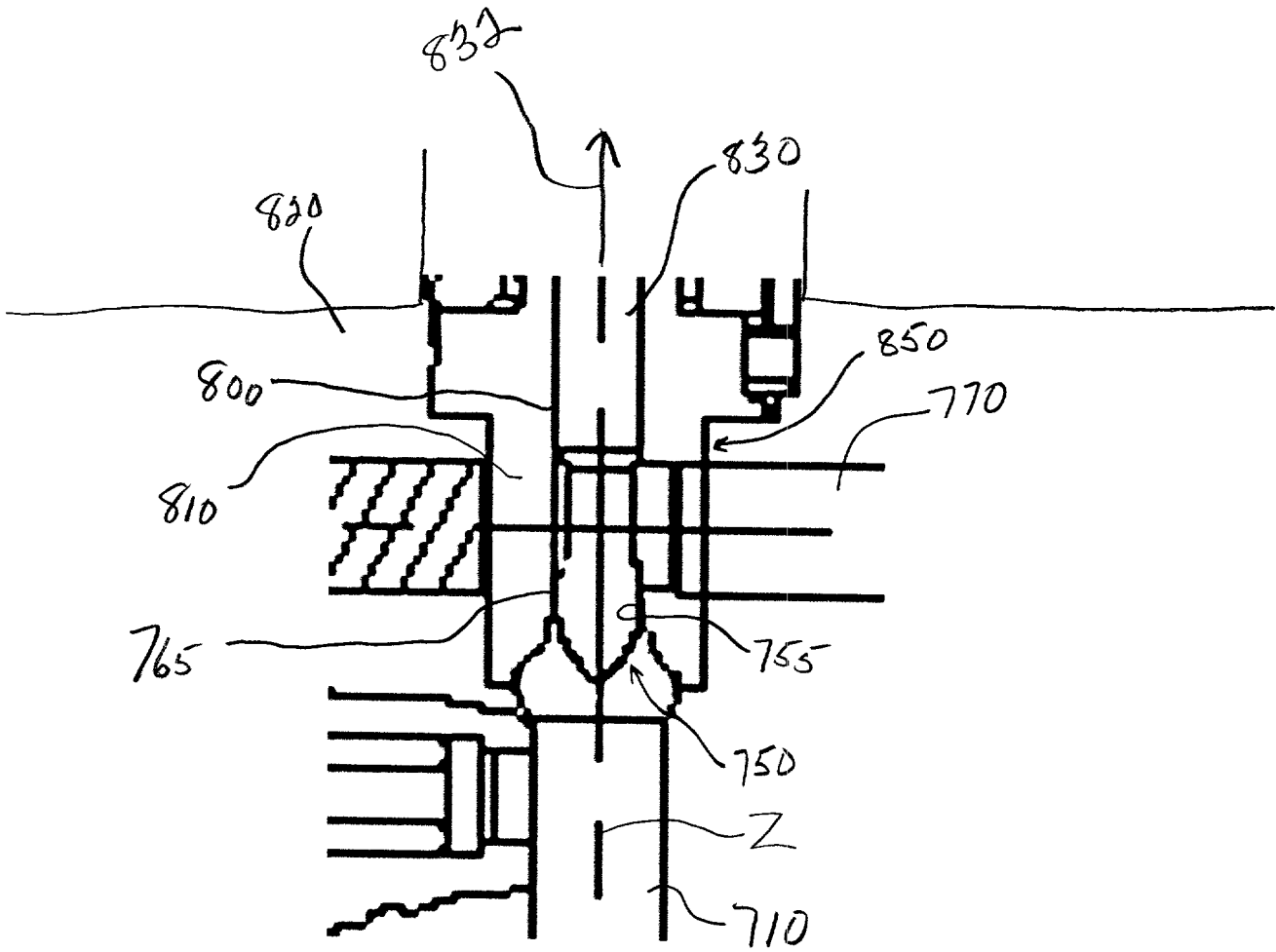


FIG. 37A

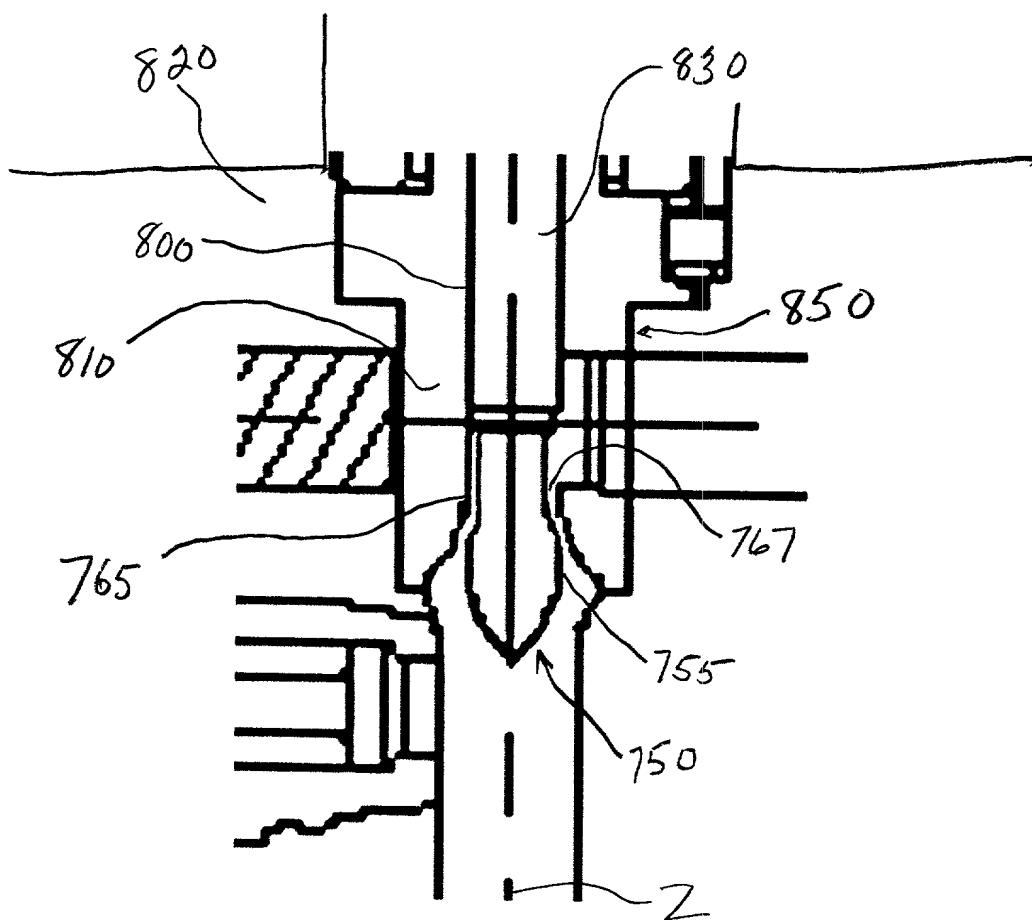


FIG. 38A

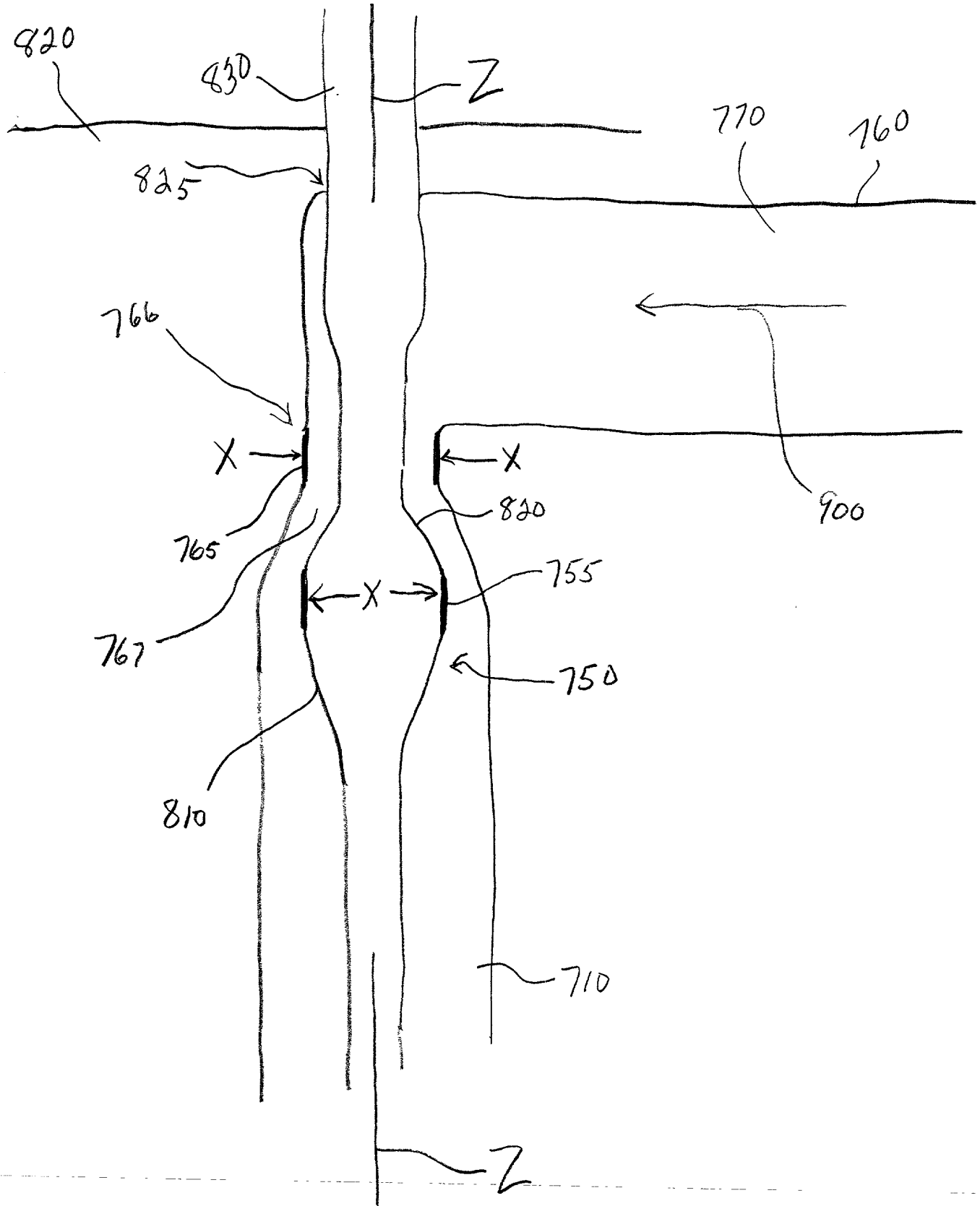


Fig. 39

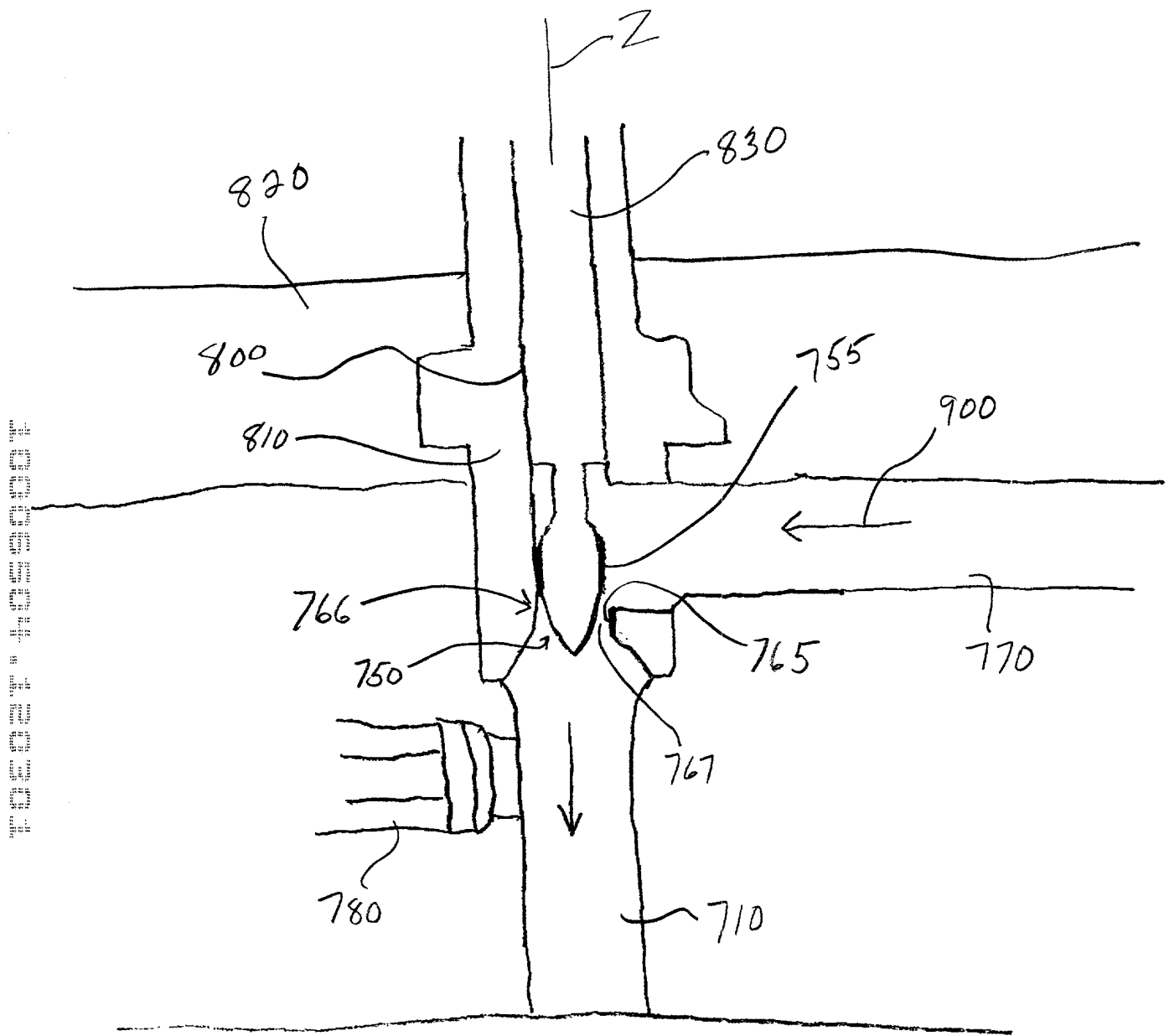


FIG. 40